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Actual Steel Needs Run High

Buyers Maintain Conservative Policies Toward Future but Top Rate of Production Is Necessary To Meet Their Requirements—Railroads and Building Industry Bring Forth Large New Demands—Ore Price Believed Near

IMMEDIATE needs still are dictating buying policies in iron and steel but they are so large in the aggregate that they are requiring a remarkable pace of production and shipments to satisfy them. The gap between production and consumption has been narrowed abnormally as requirements are being comfortably met out of large productive capacity and the efficiency of deliveries supplied by the railroads. Buyers find small incentive to discount future wants and they are not disposed to do so under present conditions. Steel works operations keep to a high clip. At Gary, the last idle blast furnace has been blown in.

Conditions in the automobile industry are in a transitory stage between the usual stocking of cars and the opening of the spring market. Some builders having completed their stocking schedule, are reducing production. The Ford Motor Co. has cut from 8000 to 7000 cars daily. Various plants still are running full.

Export trade is reported good with the leading interest averaging 8000 tons a day in recent bookings. Japan has placed with an eastern mill a tonnage of light gage sheets for reconstruction.

The matter of price does not seem to be the main deterrent at present to active buying. The market exhibits various irregularities but these are no more marked than in recent weeks except in such lines as nuts, bolts and rivets. Plates which have been generally weak, show more firmness in some districts as car tonnage is coming to the mills in greater volume. A new extra card on plates put in effect this week incorporates unimportant changes. Wire fencing manufacturers, in need of business, have put out new terms extending the net basis from 60 days to five months.

Roads Still Active

Another big week in railroad equipment buying has provided the market with its most active feature. Car orders placed in that period total 8000 including 3900 for the Louisville & Nashville, 2000 tons for the Southern and 1300 for the Nickel Plate with 1000 for the Missouri Pacific about to be placed. In addition repairs for over 2000 cars were placed. The number of cars ordered since Jan. 1 is estimated at about 75,000 compared with 63,000 for the entire first quarter of 1923. Carbuilding plants in the Chicago district now are filled to Oct. 1. New locomotive orders total 125.

Shape Needs Heavy

Demands for building steel are holding up well. February structural awards for the country are reported at approximately 189,800 tons or 73 per cent of capacity compared with 184,600 tons or 71 per cent in January. New lettings this week are numerous but not large. At Chicago four contracts representing 44,000 tons are being actively negotiated. A Joliet, Ill., fabricator is credited with a probable purchase up to 100,000 tons of plain material if the interstate commerce commission's general order for the installation of automatic train control is carried out.

The pig iron market continues flat with restrained buying but no great amount of softness. Some resale iron at Pittsburgh is coming back on the market at $22 valley. A southern producer shipping by rail and water is competing with northern furnaces in the Chicago district.

The slow slippage of IRON TRADE REVIEW's market composite of fourteen leading iron and steel products continues, bringing the index this week to $43.25. Last week it was $43.27 and a month ago $43.53.

Ore Prices Near

Iron ore prices for the season are on the verge of being settled but it still is an open question whether last year's basis will be reaffirmed or a reduction made. One leading producer is in a receptive mood for orders and it is reported would be willing to consider a lower price. A number of furnaces have opened negotiations.

Operations in the Ruhr now have been raised to about 60 per cent according to IRON TRADE REVIEW's European cable, reflecting the greater competition in the world market that recently has emanated from German producers. The latter in the Ruhr region now are reported filled for three months.

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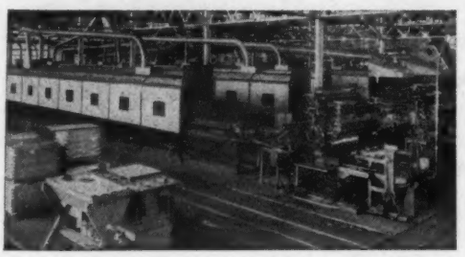
Keeping Industry in Touch With Itself

HAVE you thought of the "personals" in a trade publication as an important business register? Iron Trade Review contains an average of 25 personals in each issue, under the heading "Men of Industry." Many of these contain two or more names, and in the course of 52 issues in a year reference is made to 3000 or more individuals,



Printing on tin plate; an old art applied to modern methods. Page 789.

and information is given of their positions, promotions and changes from one company to another. Something of far greater significance than implied by the mere phrase "personal mention" is attached to this. The personnel of the iron and steel and related industries is constantly changing; there is continual weaving of a new fabric; new names are coming into prominence and old ones fading. Where else are these changes so methodically and faithly recorded as in the business publication?

Do You Know That—

Sixty-three of the largest railroad companies in the United States have renewed their subscriptions to IRON TRADE REVIEW year after year. Forty-two of the largest automobile companies also are regular subscribers.

Pig Iron Makers Confident, Though Market Is Dull—Good Sales in East—Southern Seller Competing in North

PITTSBURGH, March 18.—Dwindling interest is the chief feature of the pig iron market. One inquiry for 1000 tons of basic from a Mahoning valley user is pending. The Cleveland plant of the National Car Wheel Co. wants 500 tons of basic. The usual quotation is $22, valley. One merchant furnace is naming $22.50 on single carload inquiries. Bessemer iron is developing prices of $23 and $23.50 valley. A few makers of steel castings are expected to enter the market April 1. The A. M. Byers Co. is purchasing 600 tons of No. 3 foundry iron from three different furnaces for experimental purposes. Inquiries for single carloads or 100 tons of No. 2 iron are current. The Westinghouse Electric & Mfg. Co. wants three carloads. Certain iron purchased several weeks ago by a middle interest, expecting higher levels, is commencing to press the market. No. 2 foundry iron is available at $22, valley. Producers are quoting $23. The market for malleable and gray forge is dull. Southern, charcoal and valley low phosphorus irons are occasionally sold.

Prices Further Soften

Boston, March 18.—Despite one or two round tonnage orders the general pig iron market throughout New England cintinues quiet. Prices on sizable lots are soft, although the small buyer finds difficulty in placing prompt tonnage below the levels which have held since the first of the month. Buffalo furnaces almost without exception are holding to a $22 furnace base, which means $26.91 delivered, and which excludes them on large competitive contracts. A Connecticut consumer placed 300 tons of No. 2X (2.25 to 2.75 silicon) with an eastern Pennsylvania maker at $22.50, furnace, or $26.15, delivered, and this about represents the present market. A Massachusetts manufacturer is in the market for 1000 to 2000 tons, and market observers believe this will be placed on the basis of $22 or less, eastern Pennsylvania. Alabama and Virginia iron is held at too high a furnace price to permit competition in this market. Several sales of Alabama iron have been made, however, for mixture purposes. Inquiry is moderately encouraging and better buying is looked for before the end of the month.

Eastern Sales Total 20,000 Tons

New York, March 18.—Pig iron purchases in this territory in the past week aggregated 20,000 tons. Considerable of it is for shipment outside of this district. One New York state consumer took 5000 to 6000 tons of malleable and basic, and another took at least 5000 tons of foundry. New inquiries now before the trade involve a total of 4000 to 5000 tons. Prices on eastern foundry are unchanged, but there have been no transactions to afford a real test of the market. The level may be quoted at $22.50 to $23, base furnace. On Buffalo foundry the current quotation continues $22, base furnace, although concessions on some business are reported.

Low-Priced Sales at Buffalo

Buffalo, March 18.—Pig iron inquiry for the week was somewhat improved, aggregating 15,000 tons. The largest single inquiry was that of the New York Air Brake Co. for 5000 tons of foundry. One from the West for 3000 tons of foundry also was noted, as well as two inquiries for 1000 tons each. The Air Brake tonnage is understood to have been placed with a furnace interest outside Buffalo, where the freight rate is more advantageous. The Gould Coupler Co. purchased 2000 tons of basic of its original inquiry for 2000 to 5000 tons, and 1000 tons of malleable on its original inquiry for 1000 to 3000 tons. A 4000-ton inquiry last week is understood to have been closed with eastern Pennsylvania furnaces. The price on normal tonnage is $22, minimum, but considerable iron has gone for less than this. It is probable that a round tonnage could be placed for about $21.50.

Market in Waiting State

Cleveland, March 18.—While the pig iron market is duller than a week ago, furnace interests take a cheerful view of the situation, knowing that shipments are good and that considerably more iron will have to be purchased for second quarter. Some buyers already are making tentative inquiries. They give indications of what they probably will need, but are reluctant to close. Only one maker in the northern Ohio group finds that some of its customers overbought for the first quarter; otherwise shipments are holding well up to schedule, and in some instances exceeding expectations. Some small sales were made here last week at $24, furnace, or $24.50, delivered, the total amounting to around 800 tons. The lake furnace price generally is $24. Makers with headquarters here are meeting competition with prices of $23, valley, and the fact that iron has been sold here at $24, Cleveland furnace, would indicate that $23 is the valley minimum, although in some instances less has been done. A leading mercahnt selling interest closed for around 3000 tons last week; the aggregate for all interests with headquarters here did not exceed 5000 tons. Basic iron has not figured in the week's transactions.

Undertone Is Strong

Chicago, March 18.—The pig iron market is quiet and selling lags, but favorable factors so far outweigh unfavorable ones the undertone is strong. Some resale iron has been sold at $24, and this has led to some expectations of cheaper iron, although producers are firm at $24.50. The resale iron did not exceed 2000 tons. The market is considered too low relatively to permit short selling, and expectation of a reduction below $24.50, furnace, for northern foundry or malleable probably is vain. Many melters appear anxious to buy resale iron at about $24 and this is taken as an indication of good business in prospect. Malleable and gray iron foundries have received good orders from car builders, while demand for automotive castings is slightly reduced. Most melters are keeping inventory down and when business recovers from its present pause greater buying is probable. Washington disclosures are being discounted. Favorable developments in the foreign situation are likely to bring inquiry and sales. Chicago melters are inquiring for 600 tons of foundry iron; 600 tons of high silicon iron and several hundred tons of silveries. The range on southern iron is $23 to $24, but sales are negligible. A Milwaukee melter bought 400 tons of low phosphorus iron. Charcoal iron is $26, furnace, but sales are confined to car-

loads. A southern producer, shipping from Sheffield into northern and western Illinois on a rail and barge rate of $4.18 is offering to meet northern competition. With northern iron quoted at $24.50, Chicago, this means the southern producer is cutting his price to around $22, Sheffield, to get into points taking a freight of approximately $1.50 from Chicago.

Eastern Market Untested

Philadelphia, March 18.—Principal pig iron business in eastern Pennsylvania territory during the past week consisted of sales of several thousand tons of basic and foundry iron. In a like tonnage of 2.75 to 3.25. The Peerless Mfg. Co., Louisville, wants 1000 tons of southern iron for second quarter. Many interests which are specifying small amounts indicate that they are in need of more work and will buy if the right terms are offered. The most important sale is 300 tons of northern iron to a melter at Louisville. Prices are unchanged, nominally, at $23.50 to $24, Ironton. Although it is said $23 can be done with one furnace interest on sizable tonnage, no sales have been reported at that figure. Southern iron is quoted at $22.50 to $24, Birmingham. The $22.50 quotation represents the minimum on Tennessee iron. The Republic, Prices are unchanged. Southern iron continues to be quoted on a basis of $23.50 to $24 Birmingham, and several small transactions are reported at the lower price. Northern iron is held at $24.50, and the leading local producer is asking $25.50 to $26, f.o.b. Granite City. Consumers' stocks are light and considerable buying is to be done for the second quarter All the stove plants at Quincy, which were down earlier in the year for repairs and inventory, have resumed production, although some interests report a lack of orders. Increased activity is reported among wheelmakers and machine shops. Manufacturing of

Prices Present and Past

Representative market figures yesterday, and for last month, three months ago and one year ago

	Mar. 19 1924	Feb., 1924	Dec., 1923	Mar., 1923
PIG IRON				
Bessemer, valley del., Pitts....	$24.76	25.01	24.17	31.67
Basic, valley	22.00	22.00	20.50	29.80
Basic, eastern del., eastern Pa...	22.00	22.50	23.30	29.35
*No. 2 foundry, del. Pitts.....	23.76	24.76	23.77	31.37
*No. 2 foundry, Chicago.....	24.50	24.40	23.00	31.25
*Southern No. 2, Birmingham...	23.00	23.00	20.75	26.50
*Southern Ohio, No. 2, Ironton.	23.50	24.00	22.50	30.75
**No. 2X, Virginia furnace.....	26.00	26.50	24.50	28.25
**No. 2X, eastern del., Phila..	24.13	24.26	24.26	32.00
Malleable, valley	22.50	23.00	21.50	29.20
Malleable, Chicago	24.50	24.40	23.00	31.25
Lake Superior charcoal, Chicago	29.04	29.04	29.04	35.55
Gray forge, val., del. Pittsburgh	24.26	24.61	23.27	30.77
Ferromanganese, del., Pitts.....	112.29	112.29	113.79	120.79
SEMIFINISHED MATERIAL				
Sheet bars, bessemer, Pittsburgh.	42.50	42.50	42.50	44.50
Sheet bars, open-hearth, Pitts....	42.50	42.50	42.50	44.50
Billets, bessemer, Pittsburgh.....	40.00	40.00	40.35	44.50
Billets, open-hearth, Pittsburgh..	40.00	40.00	40.35	44.50
FINISHED MATERIAL				
Steel bars, Pittsburgh.....	2.40	2.40	2.40	2.30
Steel bars, Chicago	2.50	2.50	2.50	2.34
Steel bars, Philadelphia.....	2.67	2.72	2.72	2.705

*1.75 to 2.25 silicon. **2.25 to 2.75 silicon.

	Mar. 19, 1924	Feb., 1924	Dec., 1923	Mar., 1923
FINISHED MATERIAL (Continued)				
Iron bars, Philadelphia.....	$2.57	2.57	2.62	2.705
Iron bars, Chicago mills.....	2.40	2.40	2.40	2.53
Beams, Pittsburgh.....	2.50	2.50	2.50	2.35
Beams, Philadelphia	2.57	2.62	2.72	2.77
Beams, Chicago	2.60	2.60	2.60	2.44
Tank plates, Pittsburgh.....	2.40	2.45	2.50	2.35
Tank plates, Philadelphia	2.57	2.57	2.72	2.77
Tank plates, Chicago.....	2.60	2.60	2.60	2.44
Sheets, blk., No. 28, Pittsburgh.	3.75	3.75	3.75	3.55
Sheets, blue anl., No. 10, Pitts.	3.00	2.90	2.95	2.70
Sheets, galv., No. 28, Pittsburgh	4.90	4.90	4.90	4.65
Wire nails, Pittsburgh.....	3.00	3.00	3.00	2.90
COKE				
Connellsville furnace	4.00	4.00	3.85	7.15
Connellsville foundry, ovens....	4.75	4.80	4.80	8.15
OLD MATERIAL				
Heavy melting steel, Pittsburgh	20.00	21.60	18.35	26.10
Heavy melting steel, eastern Pa.	17.00	18.95	16.80	24.85
Heavy melting steel, Chicago...	16.50	18.00	16.00	23.15
No. 1 wrought, eastern Pa.	19.00	21.40	19.00	27.60
No. 1 wrought, Chicago.....	16.00	17.50	16.35	23.25
Rails for rolling, Chicago..... ..	19.00	20.00	17.05	24.90

Composite Market Average

Representing the Combined Average Prices Per Ton of Fourteen Leading Iron and Steel Products Yesterday, One Week, One Month, Three Months, One Year and Ten Years Ago.

Mar. 19, 1924	Mar. 12, 1924	Feb., 1924	Dec., 1923	Mar., 1923	Mar., 1914
$43.25	$43.27	$43.49	$43.02	$45.31	$23.60

Products Included Are Pig Iron, Billets, Slabs, Sheet Bars, Wire Rods, Steel Bars, Plates, Structural Shapes, Black, Galvanized and Blue Annealed Sheets, Tin Plate, Wire Nails and Black Pipe

the main sales are limited to scattered small tonnages. The market is in a nominal position at $23, base, eastern Pennsylvania for there have not been sufficient transactions recently to thoroughly test it out. Verginia foundry iron continues at $25 to $26, base, furnace, with the indications that it is closer to the latter than to the former figure. Low phosphorus is quiet.

Southern Ohio Sales Small

Cincinnati, March 18.—Pig iron sales in this district during the past week have been exceedingly scarce. Dealers report having sold two or three cars each, and inquiry is practically at a standstill. The Lima Locomotive Works, Lima, O., is inquiring for 2000 tons of northern foundry iron for second quarter delivery. The inquiry calls for 1000 tons of silicon 1.25 to 1.75 and Tuscaloosa and Alabama furnace interest are quoting $24 for prompt and second quarter delivery, and the other furnaces in the Birmingham district $23, furnace.

Buying Still Lags

St. Louis, March 18.—While pig iron users report a fair volume of new orders for their products and the melt continues to increase, actual buying of iron lags. Sales range from single carloads up to 150 tons, virtually all for prompt delivery. A local steelmaker purchased 2000 tons of basic and an East Side melter is reported to have taken a tonnage of the same grade for delivery through March and April. An inquiry for 350 tons of foundry iron for a local car builder and one for 200 tons of foundry iron for a Wisconsin melter are noted. radiators and heating apparatus continue to operate at capacity, and farm implement interests report demand for their products is considerably better that at this time last year.

Market Quiet in South

Birmingham, March 17.—Sales of pig iron in the South are few. Deliveries are active and unfilled tonnage is considerable. Quotations remain firm, $23 to $24 per ton for No. 2 foundry, with a little business still being booked at $24. Scattering orders are coming from the middle west. The one bright spot is activity being noted in the soil pipe industry and the continued activity in pressure pipe. Survey of the cast iron pipe industry, radiator making, and stove works, show no curtailment in production. The home melt is exceptional.

Iron and Steel Prices

SCRAP PRICES, PAGE 824; WAREHOUSE PAGE, 816; ORE, NUTS, BOLTS AND RIVETS AND PIPE PRICES, PAGE 820

Pig Iron

Prices per gross ton

Bessemer, valley	$23.00 to 23.50
Bessemer, Pittsburgh	24.76 to 25.26
Basic, valley	22.00
Basic, Pittsburgh	23.76
Basic, Buffalo	21.50 to 22.00
Basic, del., eastern Pa.	21.50 to 22.75
Malleable, valley	22.50
Malleable, Pittsburgh	24.26
Malleable, Chicago	24.50
Malleable, Buffalo	21.50 to 22.00
Malleable, del., eastern Pa.	24.00 to 24.50

FOUNDRY IRON SILICONS

No. 2 Northern	1.75 to 2.25
No. 2 Southern foundry	1.75 to 2.25
No. 2X East'n and Virginia	2.25 to 2.75
No. 1X Eastern	2.75 to 3.25
No. 1 Chicago	2.25 to 2.75
No. 2 foundry Eastern	1.75 to 2.25

No. 1X, eastern del., Phila.	24.63 to 24.76
No. 1X, Buffalo	22.50
No. 2 foundry, valley	22.00 to 23.00
No. 2 foundry, Pittsburgh	23.76 to 24.76
No. 2 foundry, Buffalo	21.50 to 22.00
No. 2 foundry, Chicago	24.50
No. 2 foundry, Granite City	25.50 to 26.00
No. 2 foundry, Ironton fur.	23.50 to 24.00
No. 2 foundry, Cleveland, del.	24.50
No. 2 foundry, del., Phila.	23.63 to 23.76
No. 2 foundry, N. J. tidewater	24.13
No. 2X, eastern del., Phila.	24.13 to 24.26
No. 2X, east. N. J. tidewater	24.63
No. 2X, eastern del., Boston	26.15 to 26.65
No. 2X foundry, Buffalo fur.	22.00
No. 2X, Buffalo, del. Boston	26.91 to 27.91
No. 2 southern, Birmingham	22.50 to 23.00
No. 2 southern, Cincinnati	26.55 to 27.05
No. 2 southern, Philadelphia	30.80 to 31.30
No. 2 southern, Chicago	29.01 to 29.51
No. 2 southern, Cleveland	29.01 to 29.51
No. 2 southern, Boston (rail and water)	29.91 to 30.41
No. 2 southern, St. Louis	28.17 to 28.67
No. 2X, Virginia furnace	25.50 to 26.50
No. 2X, Virginia, Phila.	30.17 to 31.17
No. 2X, Virginia, Jersey City	31.04 to 32.04
No. 2X, Virginia, Boston	31.42 to 32.42
Gray forge, eastern Pa.	22.50
Gray forge, val. del., Pitts.	24.26
Low phos., standard, valley	29.00
Low phos., standard, Phila.	nominal
Low phos., Lebanon, furnace	27.00
†Low phos., English, Phila.	26.76 to 27.76
Charcoal, Birmingham	33.00
Charcoal, Superior, Chicago	29.04

Silvery Iron

Jackson County, Ohio, furnace

7 to 8 per cent	32.00
8 to 9 per cent	33.50
9 to 10 per cent	35.50
10 to 11 per cent	37.50
11 to 12 per cent	40.00
12 per cent	42.50

Bessemer Ferrosilicon

Jackson County, Ohio, furnace

10 to 11 per cent	42.50
11 to 12 per cent	45.00
12 to 13 per cent	47.50

Ferroalloys

†Ferromanganese 78 to 82 per cent, tidewater, or furnace first hand and resale	107.50
Ferromanganese, delivered, Pittsburgh	112.29
Spiegeleisen 19 to 21 per cent furnace or tidewater	38.00 to 40.00
†Spiegeleisen, English, delivered tidewater	36.00 to 38.00
Ferrosilicon, 50 per cent contract freight allowed	75.00
Ferrotungsten standard, cents per pound contained	85.00 to 95.00
Ferrochrome, 60 to 70 chromium, 6 to 8 carbon, cents per pound contained, delivered	10.00 to 10.25
Ferrovanadium, 30 to 40 per cent per pound estimated, according to analysis	$3.50 to $4.00
Ferro carbon-titanium, carloads, producer's plant, per net ton	$200.00

†Duty paid.

Coke

Beehive, Ovens

Prices per net ton

Connellsville furnace	$4.00 to 4.25
Connellsville foundry	4.75 to 5.50
New River foundry	10.50 to 11.00
Wise county furnace	4.50 to 5.00
Wise county foundry	5.00 to 6.00
Alabama furnace	5.00 to 6.00
Alabama foundry	5.50 to 6.50

By-Product

Foundry, Newark, N. J., del.	$10.91
Foundry, Chicago, ovens	12.50
Foundry, Boston, delivered	12.50
Foundry, St. Louis	12.50
Foundry, Granite City, Ill.	12.50
Foundry, Alabama	5.00 to 6.50

Semifinished Material

Prices per gross ton

BILLETS AND BLOOMS

4 x 4-inch base

Open-hearth, Pittsburgh	$40.00
Open-hearth, Youngstown	40.00
Open-hearth, Philadelphia	44.17 to 45.17
Bessemer, Pittsburgh	40.00
Bessemer, Youngstown	40.00
Forging, Pittsburgh	45.00
Forging, Philadelphia	49.17 to 50.17

SHEET BARS

Open-hearth, Pittsburgh	$42.50
Open-hearth, Youngstown	42.50
Bessemer, Pittsburgh	42.50
Bessemer, Youngstown	42.50

SLABS

Pittsburgh	$40.00 to 41.50
Youngstown	40.00 to 41.50

WIRE RODS

¼-inch and finer

Wire rods, Pittsburgh $51.00

Standard extras, $2.50 per ton over ¼-inch; $5 for screw stock; $15 for acid wire rods. Carbon extras, $3 for 0.20 to 0.40; $5 for 0.41 to 0.55; $7.50 for 0.56 to 0.75; $10 over 0.75.

SKELP

Grooved skelp, Pittsburgh	2.35c to 2.50c
Universal skelp, Pittsburgh	2.35c to 2.50c
Sheared skelp, Pittsburgh	2.35c to 2.50c

Shapes, Plates and Bars

Prices per pound

Structural shapes, Pittsburgh	2.40c to 2.50c
Structural shapes, Phila.	2.57c to 2.82c
Structural shapes, New York	2.59c to 2.84c
Structural shapes, Chicago	2.60c
Tank plates, Pittsburgh	2.35c to 2.50c
Tank plates, Philadelphia	2.52c to 2.82c
Tank plates, New York	2.54c to 2.84c
Tank plates, Chicago	2.60c
Bars, soft steel, Pittsburgh	2.40c
Bars for cold finishing, Pitts.	2.55c
Bars, soft steel, Philadelphia	2.62c to 2.72c
Bars, soft steel, New York	2.64c to 2.74c
Bars, soft steel, Chicago	2.50c
Bars, refined iron, Pittsburgh	3.25c to 5.00c
Bars, rail steel, Chicago	2.30c to 2.33c
Bars, rail steel, mill	2.10c to 2.20c
Reinforcing bars, billet, Pitts.	2.30c to 2.40c
Bar iron, common, Phila.	2.57c
Bar iron, common, New York	2.59c
Bar iron, common, Chicago	2.40c
Bars, forging quality, Pitts.	2.65c

Hoops, Bands, Shafting

Prices per pound

Hoops, Pittsburgh, under 5 in.	2.75c to 3.00c
Hoops, Pittsburgh, 20 gage, under 1 in.	3.35c to 3.50c
Bands, Pittsburgh	2.75c to 3.00c
Cold finished steel bars, Pittsburgh base, carloads	3.00c
Cold-finished steel bars, base Pittsburgh, less carloads	3.25c
Steel shafting, Pittsburgh	3.00c
Cotton ties, bundle 45 lb. Pittsburgh	$1.69

Rails, Track Material

Standard bessemer rails, mill	$43.00
Standard open-hearth rails, mill	43.00
Relaying rails, St. Louis	27.00 to 32.50
Relaying rails, Pittsburgh	30.00 to 34.00
Light rails, 25 to 45, mill	2.00c to 2.15c
Angle bars, Chicago base	2.75c
Spikes, railroad, Pittsburgh	3.05c to 3.15c
Spikes, small railroad, Pitts.	3.25c to 3.50c
Spikes, boat and barge, Pitts.	3.50c
Spikes, railroad, Chicago	3.10c
Track bolts, Pitts. Standard	4.00c
Track bolts, Pitts., small	4.75c to 5.00c
Track bolts, Chicago	4.10c
Tie plates, Pittsburgh	2.55c to 2.60c
Tie plates, Chicago	2.60c

Spike, tie plate and truck bolt prices for carlots.

Wire Products

To Jobbers in Carloads

Prices per pound

Wire nails, Pittsburgh	3.00c
Galv'd nails, 1-inch and over	5.25c
Plain wire, Pittsburgh	2.75c
Annealed wire, Pittsburgh	2.90c
Galvanized wire, No. 9 gage, Pittsburgh	3.35c
Barbed wire, painted, Pitts.	3.45c
Barbed wire, galv., Pitts.	3.80c
Polished staples, Pittsburgh	3.45c
Galvanized staples, Pittsburgh	3.80c
Coated nails, count keg, Pittsburgh	2.60c to 2.70c
Woven wire fencing (retailers)	65 off
Woven wire fencing (jobbers)	67½ off

Chain, Piling, Strip Steel

Prices per pound

Chain, 1-in. proof coil, Pitts.	6.00c
Sheet piling base, Pittsburgh	2.55c
Hot rolled strip steel, Pittsburgh stamping quality	2.75c to 3.00c
Cold rolled strip steel, hard coils, 1½ inches and wider by 0.100-inch and heavier, 0.100-inch and heavier, base	4.75c to 5.00c

Sheets

SHEET MILL BLACK

Prices per pound

No. 28, open-hearth, Pitts.	3.75c to 3.85c
No. 28, bessemer, Pitts.	3.75c to 3.85c
No. 28, open-hearth, Phila.	3.97c to 4.17c
No. 28, open-hearth, Chicago	4.09c to 4.19c

TIN MILL, BLACK

No. 28, open-hearth, Pitts.	3.75c to 3.85c

GALVANIZED

No. 28, open-hearth, Pitts.	4.90c to 5.00c
No. 28 bessemer, Pittsburgh	4.90c to 5.00c
No. 28, open-hearth, Phila.	5.22c to 5.32c
No. 28, open-hearth, Chicago	5.19c to 5.34c

BLUE ANNEALED

No. 10, open hearth, Pitts.	3.00c
No. 10 bessemer, Pittsburgh	3.00c
No. 10, open-hearth, Phila.	3.22c to 3.32c
No. 10, open-hearth, Chicago	3.34c

AUTOMOBILE SHEETS

No. 22 Pittsburgh	5.35c

Tin Plate

Prices per 100-pound box

Tin plate, coke base, Pitts.	$5.50

Iron and Steel Pipe

Base Discounts Pittsburgh to Jobbers in Carloads

	Black	Galv.
1 to 3-inch, butt steel	62	50½
1 to 1½-inch, butt iron	30	13

Boiler Tubes

Less Carload Discounts—Carloads 4 Points Additional

Steel 3¼ to 3¾-inch	38½
Charcoal iron, 3¼ to 4½-inch	5
Seamless hot rolled, 3½ to 3¾-inch	35

Cast Iron Water Pipe

Prices per net ton

Class B Pipe

Four-inch, Chicago	$61.20 to 62.20
Six-inch and over, Chicago	57.20 to 58.20
Four-inch, Birmingham	52.00 to 53.00
Six-inch and over, Birmingham	48.00 to 49.00
Four-inch, New York	65.60 to 66.60
Six-inch and over, New York	60.60 to 61.60

Standard fittings, Birmingham, base, $110.00

6 to 24-inch, base; over 24-inch, plus $20; 4-inch, plus $20; 3-inch, plus $20; gas pipe fittings, $5 higher.

Class A pipe is $5 higher than Class B.

Scrap Has No Firmness

Declines Continue in Some Centers as Consumers Refuse To Buy and Spring Tonnages Come Into the Market

SCRAP PRICES, PAGE 824

Chicago, March 18.—Iron and steel scrap prices have receded further, as much as $2 in some cases, bringing the market down to $16.50 to $17 for heavy melting steel. Although some dealers continue rampant bears, predictions are made that melting steel is not likely to drop more than 50 cents lower. Plenty of steel can be had at $16.50.

The high rate of melting does not quite offset the fear of dealers that spring will bring a heavy inflow of country scrap. Already the supply exceeds the demand. One large buyer of blast furnace turnings and borings has been holding up shipments for 15 days and has extended its embargo a similar period. Ordinary machine shop turnings can be shipped at a profit as far as southern Ohio.

Contract business is scare, but trading among dealers is fairly active. Much scrap is on track and some is becoming distress material. Inland Steel Co. is reported to have bought melting steel at $17 recently, but is now out of the market. Knuckles and couplers are quiet, after being somewhat active for a few days. Recent railroad offerings include 5300 tons by the Rock Island, 10,000 tons by the Chesapeake & Ohio, 500 by the Wabash and 500 by the Monon.

Steel Has Wide Range

Boston, March 18.—Absence of buying from eastern Pennsylvania, coupled with a few moderate sized sales in this district have combined to give heavy melting steel an unusually wide range of $1.50. Dealers buying against old orders for shipment into Pennsylvania have offered and obtained tonnages at $12.50 shipping point, while sales have been made at $14 for nearby delivery. The whole market is listless and prices on most grades are softer than they were a week ago. The foundry grades are down perhaps 50 cents. Strictly No. 1 machinery is selling freely at $22 delivered with textile scrap held at $22.50. Stove plate is without a market, but dealers look to some buying on the part of the American Brake Shoe & Foundry Co. before the end of the month. Several small orders for blast furnace borings and turnings have been entered at $11 on cars shipping point.

Dull Trade in East

Philadelphia, March 18.—Trading in iron and steel scrap is dull and restricted largely to purchases by dealers to apply on contracts. Consumer buying is limited to small lots, particularly of wrought pipe. Dealers say the market is fundamentally strong.

No Strength in East

New York, March 18.—Several leading grades of scrap have been marked down the past week. Heavy melting and No. 1 railroad steel have been reduced again, mixed borings and turnings and clean cast borings have been affected. Weakness is also noted in cast scrap. Prices are little changed from last week. Weakness in pig iron is having a particularly depressing influence. Reflecting the easier tone in No. 1 railroad steel, dealers have reduced prices on material for shipment to Bethlehem to below $16, delivered, and it would not prove surprising to many in the trade if these prices go close to $15.

Surplus Stocks Limit Buying

Pittsburgh, March 18.—Surplus stocks of scrap in the hands of consumers are the only reason for continued absence of buying. Operating rates continue high and stocks gradually are being absorbed. While the embargo to a West Virginia point has been lifted stock there in excess of 60,000 tons precludes the possibility of early orders being placed by that consumer. The Monessen, Pa., embargo probably will remain another week. A Butler, Pa., user about to start open-hearth furnaces has recently been a seller of scrap, disposing of 500 to 1000 tons. The bundled and compressed sheets disposed of by the Apollo Steel Co., about 750 or 1000 tons, are understood to have brought $19.25 delivered, Weirton, W. Va., for the compressed sheets, or $17.75 f.o.b. Apollo. Heavy melting steel scrap still is quoted at $20 to $20.50, although buyers are hard to find. Other prices largely are the same as last week although many are nominal.

Weaker at Buffalo

Buffalo, March 18.—Some recession has taken place and heavy melting steel has been bought for $17 in a 500-ton lot, while dealers have paid $19. One consumer estimates 20,000 tons of strictly No. 1 heavy melting steel could be bought for $18. Blast furnace scrap is lower at $14 to $14.25.

Lowest at Cincinnati

Cincinnati, March 18.—With prices the lowest since November, the iron

(*Concluded on Page 767*)

Sheet Bar Inquiry Active

Buyers Closing for Second Quarter Tonnages at $42.50—Valley Makers Open Books—Slab Business Fair; Billets Quiet

SEMIFINISHED STEEL PRICES, PAGE 765

Pittsburgh, March 18.—Inquiries for and sales of rerolling billets are exceedingly quiet. Sheet bars and slabs show a marked degree of activity. Sheet bar inquiries are fairly numerous for the second quarter. These range all the way from 1000-ton lots for prompt shipment to 5000 or 10,000 tons monthly for the second quarter, and on these the price remains unchanged at $42.50, Pittsburgh or Youngstown. A few inquiries are out for slabs, particularly from the conversion mills making blue annealed sheets, and while it has been possible to obtain $41.50, in one or two directions the $40, Pittsburgh or Youngstown, quotation is available. One or two forging billet consumers have renewed their arrangements for the second quarter at $45, Pittsburgh. One of these, related to the oil well engine industry, has issued specifications almost to the full amount of the second quarter contract and it is assumed that an additional order will be placed shortly.

Wire rod customers are being taken care of to the limit of the steelmakers' ability although many of these do not have much free tonnage after their own wire products finishing departments have been supplied. Some of these buyers are in the rivet manufacturing industry, others in the cold-finishing trade. Wire rods are firm at $51, Pittsburgh. Skelp is quoted from 2.35c to 2.50c, base Pittsburgh, and one of the last contracts taken by an independent Pennsylvania steelmaker for disk wheel skelp was at the maximum figure.

Wire Rods Firm

New York, March 18.—Demand for wire rods continues fair and the market on this product is firm at $41, base Pittsburgh.

Sheet Bar Inquiries Noted

Cleveland, March 18.—Some inquiries for sheet bars were noted in the market here during the week, but the aggregate tonnage was small, and the leading maker is booked up for the second quarter so that buyers have had to look elsewhere. Orders have been closed at $42.50, valley, for sheet bars, and $40, for billets and slabs which remains the quotable market level.

Valley Makers Open Books

Youngstown, O., March 18.—Producers of semifinished material in this district have opened books for second quarter business on the basis of $42.50, Youngstown or Pittsburgh, and a fairly good tonnage of sheet bars have been entered at this figure. Some consumers have not covered beyond April. The bulk of the semifinished tonnage consumed in this district is in the form of sheet bars, with slight demand for billets and slabs. While $42.50, Youngstown, is the quotation on billets and slabs, an inquiry involving attractive tonnage would develop a price more in line with present competitive figures, namely $40 to $41.50.

Foreign Billets Higher

Philadelphia, March 18.—Several small billet sales were made in the past week. Certain mills are holding to $40, Pittsburgh, for rerolling, and $45 for forging quality. Considerably less has been done on some business. Efforts to buy foreign billets have proved unsuccessful, due to higher prices abroad. Foreign billets now

cost at least as much as American billets at tidewater.

Scrap Has No Firmness

(*Concluded from Page 766*)

and steel scrap market is off about 50 cents on all grades. Hand-to-mouth buying with some dealers eager for business is contributing to continued weakness. Heavy offerings of railroads also are a factor. The trend of the market is downward. Some dealers report requests to delay deliveries but this is not general. Railroad offerings are bringing much lower prices than a month ago.

Cleveland Market Weak

Cleveland, March 18.—Weakness of scrap prices continues at Cleveland under the influence of consumer indifference. The latter are taking new tonnage only to meet immediate or early requirements despite the fact few have large reserves. Uncertainty of the market is chiefly responsible for this condition, a wide divergence of opinion existing as to which direction prices will take. Such buying as is being done is conducted quietly, users evidently playing a waiting game in the hope of keeping prices down. Dealer transactions are fairly numerous. Similar conditions exist in the Mahoning valley although it is known one large consumer there a few days ago contracted for a good sized tonnage of heavy melting steel at a price not revealed. Canton also bought heavy melting steel. Prices generally are down 50 cents to $1 a ton although largely nominal.

Slow at Detroit

Detroit, March 18.—The scrap market continues weak owing to the large consumers being entirely out of the market, augmented by large tonnages from producers.

Prices average 50 cents lower on the principal grades. Blast furnace stock is practically unchanged. Trade is the smallest in several months.

Weaker at St. Louis

St. Louis, March 17.—Continued weakness and apathy feature the market for iron and steel scrap. Consumers buy only what they are obliged to, and prices are being resisted. Some specialties for rolling mills and foundries are being forced into the market.

The weakest spot is on steel grades. Heavy melting steel was marked down to $16.50. Cast scrap is in fairly good demand and holding relatively steady. Some specialties for rolling bills are also displaying resistance to the general downward trend, notably arch bars and transoms, steel axles, and iron angle bars. Malleable grades are slow and weak, and the inquiry for rails shows little life.

Market Holding Its Own

Birmingham, Ala., March 17.—The iron and steel scrap market is holding its own. Quotations are rather weak though no change has appeared. Heavy melting steel has lost a little strength the past week. Gulf States Steel Co. has reduced activities in open hearths. The Steel corporation is not in the market. Pipe shops are still buying a little tonnage of No. 1 cast and stove plate is in demand.

Coke Inquiries Held Back

Furnaces Expecting To Develop Lower Quotations as Result of Wage Cut—Some Uncertain of Operating—Price Structure Weakening

COKE PRICES, PAGE 765

Pittsburgh, March 18.—Blast furnaces are holding back coke inquiries, anticipating still lower prices which are expected mainly to come through a wage reduction in the nonunion producing regions. They may purchase for April, expecting cheaper coke in May and June. Some are undecided whether they will operate in the second quarter, on account of inactivity in pig iron. The coke price structure is weakening. Standard furnace coke is quoted $4 to $4.25 on contracts. None has been closed at the lower figure. Spot prices are $4, $4.10 and $4.15, applied to small lots in the past few days. One or two gas producers have closed on medium sulphur coke below $4. Several gas companies are negotiating for standard furnace coke as a substitute for anthracite coal, usually asking prices on 5000 tons monthly. One receiving a quotation of $4.50 two weeks ago since has been quoted $4. Standard foundry coke usually is priced at $5 to $5.50. Some is available at $4.75. Premium brands are $6 or higher. Only small lots are being sold. Many foundries have large stocks.

Production of coke for the week ended March 8 was 245,050 tons, as compared with 232,290 tons in the preceding week, according to the *Connellsville Courier*.

New York Market Dull

New York, March 18.—Current business in foundry coke here is limited, and the market is dull. Prices are holding firm. Some sales of spot beehive foundry have been made at $5.25, Connellsville, but it is difficult to do less than $5.50. Special brands continue to bring higher. On by-product foundry coke the market continues $10.91, delivered at Newark and other northern New Jersey consuming points.

Shipments From East Small

St. Louis, March 18.—Users of furnace coke are being supplied by by-product manufacturers and demand for beehive fuel is very light. Shipments from Connellsville and other eastern fields are much smaller than at this season in former years. Industrial coke is fairly active. Prices on all grades and varieties are unchanged.

Starting More Ovens

Cincinnati, O., March 18.—Sales of coke in this territory are not brisk, but inquiries for small lots are numerous. The market is easier than a few weeks ago. Demand for foundry coke is the outstanding feature, and additional ovens are being put in operation to supply the increased demand. The Kay-Moor ovens of the Lowmoore Iron Co., Lowmoore, Va., have resumed making foundry coke following an idleness of several weeks due to a fire. The Turkey-Knob Coke Co. in the New River district, has put 20 additional ovens in operation, making a total of 101 active. Sellers of New River and Wise county foundry coke report a satisfactory volume of orders. Sales of New River foundry coke have been made at $10.50, ovens, although some brands have brought $11. The Wise county grade ranges from $5 to $6, ovens, with the bulk of the business placed at $5.50. Connellsville coke is less active and a number of sellers are asking $5 to $5.75 on the foundry grade for second quarter. A number of contracts are pending. The Jackson Iron & Steel Co. has contracted for 6000 tons of furnace coke a month for second quarter.

Southern Market Unchanged

Birmingham, Ala., March 17.—Improvement in the coke market in the South is slow. Quotations still range from $5 to $6.50, and the rate of production has not been changed. Some coke has been piled recently. A little coke is being shipped from the district on new contracts.

More Tin Plate

Wanted By Users At Present Prices—Second Quarter Lots Negotiated

TIN PLATE PRICES, PAGE 765

Pittsburgh, March 18.—Last week specifications for tin plate to be shipped in May were received from practically all buyers, particularly among the canmakers. Some of these already are seeking to add to their first half commitments at the going market price of $5.50 per base box of 100 pounds, Pittsburgh, because of the steady rise in the pig tin market. Some sellers estimate that if based on today's price of pig tin, the price of tin plate would be at least 28 cents per box higher. Operations are higher, some mills running practically 100 per cent. The leading maker operated 97 per cent of capacity last week and some independent rates are similarly high; around 95 per cent would be about the average. Better prices from the manufacturers' standpoint are being secured on stock plate, around $5.25. A little demand is originating abroad for American tin plate and occasionally a small sale is made. No large inquiries are pending, except those from canmakers.

Valley Output at 90 Per Cent

Youngstown, O., March 18.—Not much inquiry for tin plate is before producers although this has not caused apprehension, in view of the volume of business already placed. Operation of plants in the district including 40 mills is at 90 per cent, the same as for many weeks. Tin plate continues quotable at $5.50, per base box, Pittsburgh.

The Scovill Mfg. Co., Waterbury, Conn., reports for the year ending Dec. 31, 1923 net earnings after depreciation, taxes and other charges of $3,167,761. The earnings for 1923 include profits of the Oakville Co. and the American Pin Co. of Waterbury, recently acquired by the Scovill Mfg. Co.

Bar Market Is Steady

Steady Buying and Specification by Consumers and Jobbers—Prices Steady and Mills Producing at Satisfactory Rate

BAR PRICES, PAGE 765

Chicago, March 18.—Soft steel bar business taken by local mills last week was up to the weekly average for the year to date, and order books were lengthened slightly. While all classes of bar consumers are figuring in this activity, railroad freight car builders have been more prominent. Bar mill products are in better demand than any other line of finished steel, and the price remains at 2.50c, Chicago.

Bar iron continues at 2.40c, Chicago, and rail steel bars at 2.30c, mill, or 2.30 to 2.33c, Chicago.

Reinforcing concrete bar warehouses are bringing pressure to bear upon the mills to lower the price of billet bars to them, but so far no change has been effected.

Eastern Sales Ease Off

Boston, March 18.—Exceptionally attractive steel bar sales during the first part of March have dropped off somewhat during the past week. Inquiry for second quarter delivery suggests considerable more buying before April.

Prompt Shipment Demand Good

Philadelphia, March 18.—Steel bar demand is fairly good for prompt shipment. There is more active competition and a large lot went last week at 2.30c, Pittsburgh. Some further business went at 2.35c, Pittsburgh. Prices lower than 2.40c, Pittsburgh, are exceptional.

Specify and Order Well

Pittsburgh, March 18.—Regular contracting is proceeding in merchant steel bars for second quarter. Specifications are prompt. Jobbers are buying hand-to-mouth and there is lack of speculative buying. Bars are firm at 2.40c, base Pittsburgh, except where combination orders for plates, shapes and bars, particularly from car builders, have carried a figure which would be lower than 2.40c on all of the steel.

Valley Buying Is Light

Youngstown, O., March 18.—Not much contracting for second quarter soft steel bars is being done in this district. Consumers are buying in lots sufficient to cover present requirements and the market is more or less of a spot character. Producers are selling on the basis of 2.40c, Pittsburgh, although 2.30c, Pittsburgh, frequently is encountered.

Expect Sustained Consumption

Cleveland, March 18.—Consumers of steel bars in this territory including manufacturers of automotive parts, rivets, nuts and bolts and other lines, continue to indicate their expected second quarter requirements. Invariably these are on the same basis as for the first quarter, indicating that these consumers are anticipating a continuation of their present operations. Present bookings are almost entirely in the form of day-to-day specifications and the total tonnage is large, with some leading companies being greater than a month ago. Mill shipments consequently are heavy with the result that deliveries with some of the larger mills have been further extended slightly. Steel bar prices are firm at 2.40c, Pittsburgh. Hoops and bands are soft, especially the former which shows some prices as low as 2.75c, Pittsburgh.

Cold Drawn Only Fair

Pittsburgh, March 18.—Only fair business has been done by cold finishers in cold-drawn bars the past week but this is considered logical following the effort to inaugurate the new card of extras dated March 10. The base still remains at 3.00c, Pittsburgh, and is maintained firmly except in competition with the Chicago producer quoting 3.00c, Chicago, in which case freight rates are equalized.

Anxious for Hoop Orders

HOOP PRICES, PAGE 765

Pittsburgh, March 18.—More anxiety still is manifested over prospective business in hoops and bands and leads to keen competition in price. Some large orders have carried 2.75c base Pittsburgh, against the regular 3.00c quotation. The usual concession under 3.00c is 2.90c, which still appears spasmodically even on small lots.

Nut, Bolt and Rivet Prices Erratic

NUT AND BOLT PRICES, PAGE 820

Cleveland, March 18.—Second quarter books have been opened by local bolt and nut producers, business being taken on the basis of 60 and 10 per cent off for large machine bolts. On current business, however, the 60 and 5 off price continues to be quoted. Some keen competition has developed in certain directions in recent days, making for a more erratic price situation. Demand is fair, and while individual orders are not large, the total represents a good volume.

Rivet buying continues of small proportions and little spot demand is reported. Books for second quarter have been opened contracts being taken on the basis of 2.75c, base Pittsburgh on large rivets and 70 and 10 off on small.

Closing on Second Quarter Contracts

Philadelphia, March 18.—Eastern makers are closing on their second quarter nut and bolt contracts on the basis of 60 and 10 off for large bolts. The current demand for bolts, nuts and rivets is good but prices generally are weak.

Second Quarter Prices Same

Pittsburgh, March 18.—In all probability prices on nuts, bolts and rivets will be reaffirmed for second quarter on the basis of 60 and 5 off for large machine bolts, and $4.25 off list on hot pressed square or hexagons.

Rivet makers report that during the past 10 days more orders have been placed than in as many months preceding. One order calls for about 1500 tons and is understood to be connected with car business recently placed. Rivets are 2.75c, base Pittsburgh, and small rivets 70 and 10 off although there is an increasing effort to obtain 65, 10 and 5 off.

Still 60 and 10 Off

Chicago, March 18.—Some makers of bolts and nuts are taking second-quarter business at the old level of 60 and 10 off for large machine bolts. Efforts to establish 60 and 5 off do not appear successful and the feeling is that in view of general business conditions it is wise not to attempt an advance. Specifications for bolts and nuts continue fair.

Buy Less Wire

Heavy Bookings Cause Lull but Mills Busy on Backlogs

WIRE PRICES, PAGE 765

Pittsburgh, March 18.—Because during February wire products makers filled up with business for 90 days and now are operating on those backlogs, the present period is comparatively inactive as to new business. Prices are unchanged on the basis of 2.75c, Pittsburgh, for plain wire and 3.00c base Pittsburgh, for wire nails. Cement-coated nails are averaged at 2.60c, base Pittsburgh, concessions under 2.70c continuing to come out. Operations are on a 75 per cent basis.

New discounts on fencing to jobbers and distributers have been adopted by the manufacturers and are now in effect. These extend the net basis to five months as compared with 60 days previously. Discount for cash at the rate of 5 per cent is granted. Some producers are reported to be in need of fencing business.

Eastern Deliveries Good

New York, March 18.—Wire mill operations are averaging around 80 per cent of capacity and mills are able to make good deliveries. The market is firm at 3.00c, base Pittsburgh, for nails and 2.75c for wire.

Room for Improvement

Chicago, March 18.—Conditions in wire and wire products have slipped back. Bad weather and roads have combined to retard country buying. Later business may be larger than usual, as a result, but demand has been subnormal. A slight slowing up in manufacturing lines also has been felt the past week. Railroad car builders still are heavy buyers of nails and railroads of nails and barbed wire. Operations continue at about 75 per cent, with prices unchanged.

Trying To Sell Ore at Last Year's Prices

ORE PRICES, PAGE 820

Cleveland, March 18.—Lake Superior iron ore producers have become very active in the past week, but from all indications no sales have been concluded as yet, and nothing has transpired that would tend to establish a price for the season. It is apparent that price ideas are not as firm today as they were a

few weeks ago, despite the feeling that the lull in the pig iron market is only temporary. It is about an even balance between an affirmation of last year's prices, and a reduction. Some producers, it is known, are not entirely adverse to a reduction, if they could be certain of large tonnage this year. An important producer intimates that it will name its prices within a few days. Meanwhile, some fill-in tonnage is being sold from dock at last season's prices. Furnaces are anxious to know what the new season's prices will be, and while negotiations are in progress it does not appear that anything less than last year's prices have been offered. The producers are trying at this time to get business on that basis. The Ford Motor Co. inquiry for 250,000 tons has not been closed.

Ore to Be Auctioned

Philadelphia, March 18.—Incidental to the liquidation of the American Manganese Mfg. Co. near Dunbar, 36,000 tons of manganiferous ore from Crow Wing, Cuyuna range, on dock at Cleveland, will be auctioned March 19 by Barnes & Lauflin, Philadelphia.

Inquire For Foreign Ore

New York, March 18.—Inquiries are out for some 50,000 tons of foreign iron ore. This is made up of one large lot and a number of smaller tonnages desired for mixing. It is not expected that the real seasonal buying will start until after prices on Lake Superior ores are announced.

Slow Market

Rules in Various Ferroalloys—Lower Offers Made for Ferromanganese

FERROALLOY PRICES, PAGE 765

New York, March 18.—Demand for manganese metals is very slow. There has been some inquiry out both for spiegeleisen and ferromanganese and action has been taken only on a small portion of it. The spiegeleisen market continues $38 to $40 furnace for 20 per cent. Ferromanganese continues to be quoted at $107.50, duty paid, tidewater, both for domestic and English, and at $105 for German.

Prices of the special ferroalloys and ores are unchanged with new business light in all lines excepting ferrovanadium which has been in good demand.

Small Orders Placed Weekly

Pittsburgh, March 18.—Each week brings a few small orders for alloys, mostly from the one and two-carload buyers and only in the aggregate is the tonnage involved important from a market standpoint. During the past week several hundred tons was ordered from domestic producers by three or four consumers. A few hundred tons of the English material likewise was bought, all at the full market price of $107.50, seaboard. Offers from users at lower figures have been turned down by producers as well as by English sellers. Most of the tonnage placed the past week was for third quarter. Pending inquiries are light, ranging from single carloads to 250 tons. Less-than-carload lots of ferromanganese are selling at $117.50, seaboard base, direct, to $122.50 on 5 to 10-ton lots through jobbers.

Plate Mills Lack Tonnage

Some Makers Offer To Sell $6 Below Maximum—March Car Tonnage Being Received—Card of Extras Issued by Leading Interest

PLATE PRICES, PAGE 765

Pittsburgh, March 18.—Much plate capacity is unoccupied especially among independent mills and this explains in part some of the low prices appearing recently. While the market is quoted at 2.35c to 2.50c, base Pittsburgh, as much as $6 per ton below the maximum of 2.50c has been done. A price of 2.50c by the steelmakers is done to fabricators in the Pittsburgh vicinity. The Carnegie Steel Co. continues to operate its platemaking departments at about 90 per cent of capacity. It has just issued a new card dated March 1, 1924 showing standard classification of extras on plates. This practically duplicates the preceding card dated Oct. 1, 1921, except insofar as the cutting extras are concerned. On the old card no extra was charged for cutting rectangular lengths, 3 feet or over; now there is no extra charged for lengths 5 feet or longer up to and including 80 feet. For lengths 80 to 100 feet, an extra of 25 cents now is charged and on lengths over 100 feet the extra will be named by special arrangement. For lengths under 5 feet down to 3 feet, an extra of 10 cents is charged; the other cutting extras are the same as formerly. It is understood that this card is also being adopted by the independent makers .

Most of the steel involved in the recent awards of 12 barges to the American Bridge Co. by the Tennessee Coal, Iron & Railroad Co. 1750 tons, represents plates. One or two gas holders are pending in the East and one for New York territory probably will be let this week involving about 4000 tons.

In Market for 4000 Tons

New York, March 17.—The largest inquiry for plates that has come out here in some time is one from the Standard Oil Co. of New Jersey which is in the market for about 4000 tons for stills. It is expected this work will be closed without delay. The Petroleum Iron Works Co. recently booked 10 stills, requiring a total of about 200 tons of plates, for the Utah Oil Refining Co. Other demand is of a scattered character and involves small lots for quick shipment. The market ranges from 2.25c to 2.40c, base Pittsburgh.

Eastern Prices Easier

Philadelphia, March 18.—Several interesting plate jobs have been placed or are pending. The general run of business, however, continues to involve small or moderate prompt lots. Prices are easier. The general market is 2.25c to 2.35c, Pittsburgh, but in some instances even small lots have sold at 2.20c. Mill operations have increased somewhat, but all on current business and mills have no backlogs. The Atlantic Refining Co. has placed a gasholder with the Chicago Bridge & Iron Works, involving 900 tons of plates, and it also placed five large stills, involving 500 tons with Vought & Sons, Louisville, Ky. The Bethlehem Steel Co. is low bidder on two-car floats for the Jersey Central railroad. The Todd Ship & Dry Dock Co. is low bidder on a ferryboat for the New York Central. The Alaska Steamship Co. has withdrawn its inquiry for a steamer. The Southern Pacific railroad will open revised bids on two boats March 20. The Baldwin Locomotive Works is to place over 2000 tons of locomotive plates shortly.

Market Has Firmer Tone

Cleveland, March 18.—Somewhat steadier price conditions in plates are developing due in considerable measure to the tonnage specifications for car steel which now are flowing to the mills against recent car orders. While 2.40c, Pittsburgh, still may be done on desirable business, less than this figure which recently was obtainable, is rarer. In a tonnage way, the market shows no particular change. Business continues to come out in a fair volume in miscellaneous lots. Inquiries for four boats, three large and one of smaller size, remain before lake shipbuilders. A number of oil stills continue to be negotiated. Pittsburgh mills will furnish a fair tonnage of steel for that portion of an order of locomotives for the Nickel Plate railroad just placed with builders in this district. A riveted water line for Detroit soon to be out for figures will require considerable tonnage.

Anxious for Business

Chicago, March 18.—Makers of steel plates are scurrying for business and can give good delivery. In the past week a fair amount of business in plates has been placed, most of it in carloads to 100 tons. Though plate schedules are not rounded out, there is improvement over two weeks ago. Freight car builders are the most active seekers for plates. The quotation is 2.60c, Pittsburgh.

Let Rebuilding Contracts

Contracts for the rebuilding of one of the American Radiator Co.'s stacks at North Tonawanda, N. Y., recently were let to William B. Pollock Co., Youngstown, O. When this reconditioned stack is ready for operation the officials plan to replace the other furnace of the Tonawanda group with a modern stack.

Gary Stacks All In

Chicago, March 18.—The Illinois Steel Co. has blown in its twelfth stack at Gary, Ind., making its entire battery active. In addition this company has 10 stacks active at South Works and 3 at Joliet, Ill., or 25 out of its 27 steel works stacks in this district. Its general operations average 95 per cent. The Inland Steel Co. is operating at as near full as conditions permit.

Concrete Market Listless

Little New Business Is Brought Out as Spring Building Projects Are Delayed—Prices Show No Further Weakness

REINFORCING BAR PRICES, PAGE 765

Chicago, March 18.—Several reinforcing concrete bar interests claim to be doing normal business for the season although it is apparent that the trade continued in a pocket of inactivity. Architects have a tremendous amount of proposed construction on their boards but in many instances the decision to proceed or hold up will hinge upon the effect of the Washington investigations upon business in general. It may be that the severe winter makes for delay. Between 2000 and 3000 tons of bars will be required for the hotel projects and additions that are likely to go ahead if the price of steel is right. In a half dozen building projects that have been before the bar interests for some weeks are involved close to 2000 tons of bars. There is no lack of pending business, and if uncertainty can be displaced by assurance a record-breaking amount of spring buying will develop. Small warehouses and jobbers are ordering cautiously. A spread of 2.75c to 3.00c, Chicago, still exists.

Bids will close April 7 on 800 tons of reinforcing bars and 78 tons of spirals for the Fort Snelling-Mendota bridge, Minneapolis. Plans and proposals may be had from Walter H. Wheeler, engineer, 1112 Metropolitan Life building, that city.

Demand More Active

Cincinnati, March 18.—Demand for concrete reinforcing bars is becoming more active. An increased number of projects is up for bids, and lettings are expected to increase. Prices are somewhat firmer and it is difficult to shade 2.69c, delivered Cincinnati, or 2.40c, Pittsburgh. The new city hospital, Dayton, O., plans for which will be ready for figuring shortly will require 150 tons of bars. Other projects which have been announced and which will involve bars are 150-car garage of the Vernon Manor apartment building and an addition to the present plant of the Globe Folding Box Co. The Times-Star Publishing Co. will build a 7-story building adjoining its present plant.

Seasonal Buying Delayed

New York, March 18.—Demand for concrete reinforcing bars is quiet and the seasonal buying does not yet show any signs of getting started. On mill shipments the market continues 2.30c to 2.40c, base Pittsburgh. On Pittsburgh warehouse stocks the quotations range from 2.60c to 2.75c, base Pittsburgh. On New York stocks the prices are 3.10c to 3.25c base.

Price Concessions Appear

Pittsburgh, March 18.—Concrete bar projects continue for the most part to be deferred including large tonnages for road work. Concrete bars needed in the Kaufmann & Baer Co.'s warehouse, about 1000 tons, have not been placed by Hughes-Foulkrod Co., general contractor. No action has been taken in connection with the addition to the Homewood, Pa., plant of the Westinghouse Electric & Mfg. Co., 375 tons, as reported last week and this may be indefinitely postponed. The mill price on concrete bars is unchanged at 2.40c, base Pittsburgh, some concessions of $2 per ton under that level have appeared. Warehouse prices of fabricators are 2.60c base Pittsburgh.

Activity Still Restricted

Cleveland, March 18.—Activity in concrete reinforcing bars still is restricted to small tonnage lots. Inquiries are fewer but prospects point to a large volume of requirements within the coming months. Few contracts were placed last week calling for more than 50 tons each. Prices show no further weakness. New steel bars are quotable at 2.30c, Pittsburgh, although much of the tonnage placed went at 2.40c which price shows signs of again becoming the minimum. Rail steel bars are firm at 2.10c, mill, with little tonnage moving.

Eight roadwork projects now pending in Ohio will require several hundred tons. Pennsylvania railroad is to close immediately on 184 tons for grade elimination work here. A good tonnage of bars was purchased by the Pittsburgh office of The Dresser Minton Co., general contractor, for a stadium at Lewisburg, Pa., for Bucknell college.

CONCRETE CONTRACTS PLACED

Awards this week	3,680 tons
Awards last week	3,825 tons
Awards two weeks ago	7,101 tons

800 to 1000 tons, Hotel Duluth, Duluth, Minn., to American System of Reinforcing.
700 tons, Pacific Telephone & Telegraph Co. building, New Montgomery street, San Francisco, to Edw. L. Soule Co.
500 tons, garage at Albany, N. Y., to Concrete Steel Co.
300 tons, loft building at Boston, to Concrete Steel Co. General contractor, J. Shapiro & Son.
300 tons, Commonwealth avenue building, Boston, to Concrete Steel Co.
300 tons, two junior high schools, Appleton, Wis., to Concrete Engineering Co.
140 tons, Crocker estate building, Market street, San Francisco, to Truscon Steel Co.
130 tons, Ledger building addition, Philadelphia, to Concrete Steel Co.
110 tons, roadwork at Stone Creek, O., to Concrete Steel Co.
100 tons, work for Rock Island railroad, to Truscon Steel Co.
100 tons, Central high school Wausau, Wis., to Concrete Engineering Co.
Tonnage not stated, stadium for Bucknell college, Lewisburg, Pa. Bought by Pittsburgh office of the Dresser Minton Co.

CONCRETE CONTRACTS PENDING

2334 tons Ross Island bridge, Portland, Oreg.; bids in April 1.
800 tons, Fort Snelling Mendota bridge, Minneapolis; bids close April 7. Plans and proposals from Walter H. Wheeler, 1112 Metropolitan Life building, Minneapolis.
775 tons, Metropolitan hotel, Los Angeles; bids in.
618 tons, Western Custome Co., Ninth and Broadway, Los Angeles; bids in.
182 tons, Brunswick Drug Co., Los Angeles; bids being received.
184 tons, substructure work for grade elimination program of Pennsylvania railroad, Cleveland; to be placed immediately.
150 tons, city hospital, Dayton, O.; plans ready soon.
100 tons, First National Bank building, Hammond, Ind.; pending.
100 tons, Kimball Trust & Savings bank building, Chicago; Jos. T. Ryerson & Son, Inc.; low bidder.
Tonnage not stated, 150-car garage for Vernon Manor apartments, Cincinnati; pending.
Tonnage not stated, plant addition for Globe Folding Box Co., Cincinnati; pending.
Tonnage not stated, eight road jobs in Ohio; bids in.
Tonnage not stated, Times-Star Publishing Co., 7-story building, Cincinnati; pending.

Pipe Mills

In Enviable Position—Operations Are High—Cast Demand Increasing

PIPE PRICES, PAGE 765 AND 820

Pittsburgh, March 18.—Pipe enjoys an enviable position from a demand standpoint. Operations are high, buttweld furnaces running between 95 and 100 per cent of capacity, and lapweld furnaces are fast approaching a similarly high rate. Pipe finishing departments are being operated practically full. No letup is encountered in the demand for standard full weight merchant pipe although jobbers everywhere are fairly well fortified with stocks against the spring influx of business from builders. Deliveries are deferred from four to six weeks. Stocks now are well balanced and replacements have not as yet been rendered necessary. Lapweld pipe demand is growing indicating improvement in the oil well drilling industry despite the adverse effect on that business exercised by the present investigation in Washington. Jobbers have ordered fair sized stocks and large oil companies are placing orders for from one to 10 carloads at a time.

Changes in the tube end of the pipe industry are few. Demand for boiler tubes is improving slightly, some locomotive and stationary boiler business lately having been placed. Seamless tubes are in fair demand from automotive and other consuming interests, as is mechanical tubing. Prices are unchanged on the bases of the cards of April, 1923.

Municipal Tonnage Bought

New York, March 18.—General contractors have let contracts on more than 2300 tons of pipe for the local water department. Of this business 975 tons of 20-inch pipe and 340 tons of 12-inch high pressure pipe went to the United States Cast Iron Pipe & Foundry Co., and 1005 tons of 36-inch pipe and about 30 tons of fittings went to the Warren Pipe & Foundry Co. A lot of 2000 tons of 30-inch pipe for Queens is not pending, general contractor's bids to close March 26. The market generally is active, with prices strong.

Closing on Municipal Jobs

Chicago, March 18.—With the coming of spring the smaller midwestern cities are looking more closely to their cast pipe requirements. The United States Cast Iron Pipe & Foundry Co. has been awarded 2800 tons at Dayton, O., that has been hanging fire. The National Cast Iron Pipe Co. this week probably will be awarded 225 tons at Manitowoc, Wis., and 220 tons at Arkansas City, Kans. Columbus, O., has opened bids on 1600 tons. Municipal buying is more prominent than utility buying. Cities are paying $61.20 to $62.20, Chicago, for their 4-inch pipe.

Delayed Delivery Slows Inquiry

Birmingham, Ala., March 17.—Purchasers of cast iron pipe are complain-

ing of inability to get delivery and this has caused a slight reduction in inquiries. Manufacturers of cast iron pipe in this section are well booked ahead, in smaller sized pipe from 30 to 90 days. Quotations remain unchanged. Soil pipe plants of this district are speeding up production. Soil pipe prices are based on $60 for standard pipe.

Municipality To Buy

Cleveland, March 18.—Bids are to to be taken April 4 by city engineers on 1815 tons of straight bell and spigot pipe and 55 tons of miscellaneous specialties for the Woodlawn avenue mains of the Baldwin-Fairmount reservoir project.

CAST IRON PIPE AWARDS

4230 tons, Kansas City, to United States Cast Iron Pipe & Foundry Co.
2800 tons, Montgomery County, O., to the United States Cast Iron Pipe & Foundry Co.
2500 tons, Toronto, Ont., to National Iron Pipe, Ltd.
2350 tons, department of water, gas and electricity, New York, placed through general contractors as follows: 975 tons, 20-inch pipe and 340 tons, 12-inch high pressure pipe, to the United States Cast Iron Pipe & Foundry Co., and 1005 tons of 36-inch pipe and 30 tons of fittings to the Warren Pipe & Foundry Co.
772 tons, Flint, Mich., to American Cast Iron Pipe Co.
550 tons, Kansas City to National Cast Iron Pipe Co.
405 tons, 4 to 14-inch class B pipe for Gilroy, Cal., to United States Cast Iron Pipe & Foundry Co.
304 tons, Jackson, Mich., to American Cast Iron Pipe Co.
151 Tons, Pontiac, Mich., to American Cast Iron Pipe Co.
120 tons, Port Arthur, Tex., to American Cast Iron Pipe Co.
109 tons, 4 and 6-inch class B pipe for Aberdeen, Wash., to Gordon & Belyea, Inc., Seattle, for French made pipe.

CAST IRON PIPE PENDING

2000 tons 30-inch pipe for department of water gas and electricity, New York; general contractors' bids close March 26; pipe is for use in Queens.
1815 tons, Woodlawn avenue main of Baldwin-Fairmount reservoir project, Cleveland; bids in April 4.
1600 tons, Columbus, O.; bids in.
1127 tons, 4 to 12-inch class B pipe for Glendale, Cal.; bids in.
400 tons, Litchfield, Ill.; bids March 26.
300 tons, Wapato, Wash., 4 to 10-inch class B pipe; bids rejected, will readvertise.
250 tons, Jacksonville, Ill.; bond issue up April 1.
100 tons, Birmingham, N. Y., Suburban Engineering Co., that city, low on the general contract.
100 tons, Springfield, Ill.: bids in.

Strip Orders Are Fair

STRIP PRICES, PAGE 765

Pittsburgh, March 18.—Day-to-day orders for hot and cold-rolled strip steel are fair although large tonnage specifications are rare. Some contracts were taken on the re-affirmed bases, 3.00c and 5.00c, Pittsburgh, in hot and cold strips, respectively, but regular customers buying large tonnages have been able to book their requirements at 2.75c to 2.90c on hot strips and as low as 4.75c on cold. Operations are on an 80 per cent average, some plants running practically full. The West Leechburg Steel Co., is giving its 12-inch mill another turn and other plants likewise are increasing operations slightly. Demand is diversified although most consumption seems to be in connection with automotive and allied industries.

Sterling Bolt Co., Chicago, has increased its capital stock from $20,000 to $30,000.

Sheet Business Is Quieter

New Tonnages Placed Insufficient To Keep Mills Operating at Present Rate—More Concessions Appear

SHEET PRICES, PAGE 765

Youngstown, O., March 18.—A slowing down of demand for all grades of sheets is apparent. Consumers are holding their purchases to absolute needs. Producers have sufficient business to continue current operating schedules through March. Black sheets are weak, more mills quoting this grade at 3.75c, Pittsburgh. Some producers are obtaining business at 3.85c, but in a number of instances it has been necessary to meet competitive figures $2 a ton lower. While 5.00c, base, Pittsburgh, is being quoted on galvanized sheets, the volume of business is not in line with that of a month or two ago. The attention of purchasers has been attracted to a price of 4.90c, Pittsburgh, quoted them by producers in need of tonnage. Unless demand broadens during the next two weeks, little change in the price situation is likely to be noted during the first part of the next quarter. Producers of high-grade sheets have full operating schedules, which they will maintain into the first week of April, based on the volume of business on file. Consumers are confining their purchases to current requirements. A number of the larger users have not placed orders covering full requirements for the second quarter, but as long as spot tonnage keeps coming in producers are satisfied. No weakness has developed in the price of full finished sheets which continue quotable at 5.35c, Pittsburgh. Automobile seconds, however, are difficult to move.

Small Orders, Total Large

Chicago, March 18.—In the past week sheet mills have received a number of fair orders, some of them from unexpected sources, and the aggregate has added substantially to bookings for the second quarter. Most mills still have holes here and there in their schedules whereby they can take care of further business, but they are rapidly filling. The weakness in sheets to the east of Chicago is claimed not to have affected prices here, and makers affirm their adherence to 3.00c, Pittsburgh, for blue annealed, 3.85c for black and 5.00c for galvanized. The Japanese business for which inquiry was current here last week appears to have gone to eastern mills.

Some Mills Lack New Business

Pittsburgh, March 18.—New business coming to many of the independent sheet plants is far from satisfactory, although some are booked up to or slightly in excess of capacity. Specifications keep up well. One important maker reports that so far this month specifications have been at a rate slightly in excess of its maximum output. The general operating average still is between 80 and 85 per cent. Some plants on a 76 per cent basis last week are starting out the present week with 83 per cent of sheet capacity scheduled. Blue annealed sheet orders for railroad cars recently have been numerous and additional orders were placed in the past week for that grade. Some further buying in car roofing sheets is expected this week. Fair tonnages of blue annealed sheets have been bought for other purposes. Full finished automobile sheets as well as the other grades used in automobile manufacture have been active for several weeks past, and because automobile makers are not maintaining heavy stocks of raw materials this character of buying is expected to continue, providing their spring sales measure up to expectations. Buying of black and galvanized sheets appears to be on the increase. Makers who are obtaining the full market quotations appear to have the largest backlogs of orders. Recent entrance into the sheet business of one or two new companies leads some buyers to hope that low prices will be available, with the regular market still quotable at 3.00c, 3.85c, 5.00c and 5.35c, base Pittsburgh, respectively, on blue annealed, black, galvanized and full finished automobile sheets. Concessions under those levels, usually around $2 per ton, particularly on black and galvanized, still are available

New Orders Equal Shipments

Philadelphia, March 18.—New sheet business generally is equal to shipments, but mills are unable to build up a backlog, and hence there is considerable eagerness to get orders. Deliveries range from two to three weeks. Prices are unchanged. Blue annealed is 3.00c, Pittsburgh, with some exceptions; black is 3.75c to 3.85c, and occasionally less. Galvanized is 4.90c to 5.00c.

Manganese Ore Higher

New York, March 18.—Owing to the active buying of manganese ore by Europe and the strong market conditions prevailing abroad, higher prices are being asked here by importers. On Caucasian manganese ore the asking prices now are 45¾ cents per unit, c.i.f. tidewater for the washed grade, and 43 cents for the ordinary grade. Prices on other manganese ores are largely nominal. Some Brazilian ore for second half shipment is offered at 46 cents. On Indian ore the market is nominal around 45 cents. Some ore has been under negotiation recently but consumers decided not to place at this time.

Ford May Build Plant

Buffalo, March 18.—Henry Ford has taken an option on land across the Erie canal from Buffalo where it is reported he will build a plant having 600 cars daily capacity, providing the canal is filled in and switching facilities provided. Buffalo city council will ask of the state of New York to abandon the portion of the canal in question. The council was requested by the chamber of commerce to take this action as an incentive to industrial development.

Shape Outlook Is Bright

Prospective Large Awards Expected To Place Shops in Good Condition—Small Lettings Continue in Heavy Volume—February Bookings Gain

STRUCTURAL SHAPE PRICES, PAGE 765

Washington, March 18.—February sales of structural steel were at the rate of 189,800 tons as compared with a rate of 184,600 tons in January, according to reports of the department of commerce. Shop activity was at 73 per cent of capacity based on reports from 158 companies with an aggregate capacity of 228,155 tons monthly. Operations in January were at 71 per cent of capacity. Actual bookings by the 158 companies reporting were 167,322 tons as compared with 165,219 tons in January reported by 168 companies.

For comparative purposes, the figures below are prorated to obtain the estimated total for the United States of a capacity of 250,000 tons per month for 1922 and 260,000 tons for 1923 and 1924. The figures represent the tonnage booked each month by 177 identical companies, six of which now are out of business, with a capacity in 1923 of 234,057 tons per month.

	Actual bookings tons	Per cent of capacity	Estimated total bookings
1922 total	1,690,566		1,921,250
1922 mo. aver.	140,881	64	160,104
January, 1923.	173,668	73	189,800
February	185,283	78	202,800
March	220,832	93	241,800
April	186,779	79	205,400
May	132,441	56	145,600
June	118,708	50	130,000
July	118,032	50	130,000
August	135,530	57	148,200
September ...	122,083	52	135,200
October	112,792	48	124,800
November	125,761	54	140,400
December ...	187,429	80	208,000
1923 total....	1,819,338		2,002,000
1923 mo. aver.	151,612	64.2	166,833
January	165,219†*	71	184,600
February	167,322**	73	189,800

†Revised. *Reported by 168 firms with a capacity of 232,195 tons. **Reported by 158 firms with a capacity of 228,155 tons.

March Sales Heavy

Boston, March 18.—Leading steel interests report structural steel sales to date in March as heavier than for any similar period in 1923 and as indicating a b tter total for March than for any month in more than a year. Prices are slipping off slightly. Against contracts placed within the week plates have sold at 2.30c, Pittsburgh, and shapes at 2.35c.

Much interest among bridge builders centers in the project at Springfield, Mass., calling for 2500 tons and for which bids close March 25. The Boston Statler hotel project is again active, and it is reported contract will be let early in April. Present plans call for an excess of 5000 tons.

Outstanding Protections Numerous

Pittsburgh, March 18.—Numerous protections are out in connection with structural shapes on tonnages which fabricators are figuring upon. The inquiry rate remains high. Five bridges are pending for southern West Virginia counties which in the aggregate will take a large tonnage of steel and several local bridges will take many thousand tons if they are voted upon favorably at the spring primaries. Lettings in this vicinity are few. Some structural shape buyers have protected themselves for their needs in the second quarter some at the full 2.50c, base Pittsburgh level.

The Carnegie Steel Co. has received an order from the federal engineers of the Louisville district to furnish 1200 tons of steel piling for dams No. 45 and No. 46.

Firmer Tone Reflected

New York, March 18.—The local structural market reflects a firmer tone than in several weeks. In the aggregate a substantial tonnage has been placed lately. Business under active contemplation is large. The great majority of fabricators now are offering little for shipment under three months. Shapes are holding steadily at a range of 2.40c to 2.50c, Pittsburgh.

Mill Operations Maintained

Philadelphia, March 18.—Structural shape demand here is fair with mill quotations well maintained. Shape mills have somewhat better backlogs in this district than plate mills. The Chesapeake & Ohio yesterday opened bids on 2000 tons of shapes, plates and bars. Plain shapes are going at 2.25c to 2.35c, Pittsburgh.

A Philadelphia buyer last week, received a shipment of 100 tons of Belgian angles, of which about 65 tons was rejected because the product was not sufficiently close to inch dimensions, having been rolled to millimeters. Other buyers report satisfaction with shipments received.

Buying Quickens Slightly

Cleveland, March 18.—Structural shape buying in this district showed a slight quickening last week with a half a dozen projects requiring about 2500 tons being placed. Inquiry continues to lag although heavy tonnages are in prospect. Deliveries from larger shops average from six to 10 weeks although a few fabricators are willing to make concessions to get attractive quick delivery orders. With the exception of a few interests in need of bookings, fabricated prices are fairly firm. No weakness of the 2.50c, Pittsburgh, price on plain material is evident.

Spring Prospects Are Brighter

Chicago, March 18.—Within the structural steel market there is a strong belief that some large placements are due shortly. Two projects which have not yet been publicly mentioned, involving nearly 12,000 tons of steel, are understood to be ready for award so soon as financing is completed. There is a strong belief that the Palmer house project, involving 17,000 tons, and the Stevens hotel, involving about 15,000 tons, are due to break; bids on the Palmer house were opened March 15. It is reported that the Bates Expanded Steel Truss Co., Joliet, will be in the market for a large tonnage, up to 100,000 tons, for poles in case the interstate commerce commission does not rescind its automatic train control order. Local fabricators have inquiries for 1470 tons of steel for export to China and 700 tons to Japan.

Within the next week a decision concerning the building wage scale, effective May 1, will be reached, and this element of uncertainty eliminated. The plain material price continues 2.60c, Chicago.

STRUCTURAL CONTRACTS PLACED

Building awards this week ..... 24,656 tons
Building awards last week ..... 21,406 tons
Building awards two weeks ago .. 24,591 tons

2000 tons, warehouse for Louisville Gas & Electric Co., Louisville, Ky., to Louisville Bridge & Iron Co.

1930 tons, public schools Nos. 212 and 214, Brooklyn, N. Y., each involving 965 tons, to McClintic-Marshall Co.

1800 tons, sheet mill building for the Youngstown Sheet & Tube Co., Youngstown, O., announced last week as let to an independent fabricator, to the Blaw-Knox Co.

1750 tons, mostly plates for 12 barges for use on the Warrior river by the Tennessee Coal, Iron & Railroad Co., Birmingham, Ala., to the American Bridge Co.

1329 tons, Bell building, Chicago, to Morava Construction Co.

1200 tons, bascule bridge, California avenue, Chicago, to Mt. Vernon Bridge Co.

1165 tons, public school No. 180, Brooklyn, N. Y., to Levering & Garrigues Co.

1000 tons, school No. 201, New York, to Jones & Laughlin Steel Corp.

800 tons, bridgework at Depew, N. Y., for New York Central, to American Bridge Co.

800 tons, bridge for Delaware & Hudson, Troy, N. Y., to American Bridge Co.

800 tons, branch bank for Italian Discount & Trust Co., at Lafayette and Spring streets, New York, to Levering & Garrigues Co.

700 tons, bridge at Haverhill, Mass., to Boston Bridge Co.

660 tons, Knights of Columbus hall, Columbus, O., to Massillon Bridge & Structural Co.

650 tons, Michigan Central railroad grade crossing elimination work at Spring Wells, Mich. to the McClintic-Marshall Co.

600 tons, loft addition at Thirty-eighth street and Eighth avenue, New York, to Harris Structural Steel Co.

600 tons, plant extension for Tennessee Copper & Chemical Co., Cincinnati, to Fort Pitt Bridge Works.

575 tons, office building for Waterman Pen Co., Boston, to Levering & Garrigues Co.

550 tons, building for Illinois Glass Co., Cumberland, Md., to Shoemaker Bridge Co.

550 tons, extension to plant of Illinois Glass Co., Bridgeton, N. J., to Shoemaker Bridge Co.

500 tons, substation for Consolidated Gas Electric Light & Power Co., Baltimore, to Belmont Iron Works.

500 tons, addition Aquinas institute, Rochester, N. Y., to Genesee Bridge Co.

500 tons, apartment on Eleventh avenue, New York, to A. E. Norton, Inc.

450 tons, building for Spalding Bros., Tonawanda, N. Y., to Buffalo Structural Steel Co.

450 tons, Presbyterian community house, Fifty-fifth street, New York, to Levering & Garrigues Co.

430 tons, plant addition for Erie Steam Shovel Co., Erie, Pa., to Fort Pitt Bridge Works.

400 tons, Stanley building, Erie, Pa., to Erie Steel Construction Co.

400 tons, additional steel, towers, Niagara Falls, Lockport & Ontario Power Co., to Archibald Brady Co.

400 tons, additional work for New York Edison Co., in connection with one of its power plants, New York, to American Bridge Co.

400 tons, reconstruction work on Girard avenue bridge, Philadelphia, to American Bridge Co.

400 tons, addition to Brooklyn Union Gas Co., Brooklyn, N. Y., to Berlin Construction Co.

400 tons, apartment at Nineteenth and Panama streets, Philadelphia, to American Bridge Co.

300 tons, municipal bath house, New York, to McClintic-Marshall Co.

300 tons, Watertown, Mass., high school, to A. L. Smith.

300 tons, Toledo Art Museum building, Toledo, O., to American Bridge Co.

275 tons, overhead crossing for Detroit, Toledo & Ironton railroad, to Wisconsin Bridge & Iron Co.

233 tons, bridge at Danville, Ky., to American Bridge Co.

220 tons, Independence road bridge at Kansas

City, Mo., to Wisconsin Bridge & Iron Co.
205 tons, Pawtucket, R. I., high school, to Providence Steel & Iron Co.
200 tons, crane runways for Pacific Portland Cement Co., at Redwood City, Cal., to Mortenson Construction Co.
200 tons, junior high school, Amsterdam, N. Y., to Kellogg Structural Steel Co.
200 tons, addition, Simonds Saw & Steel Co., Lockport, N. Y., to Simonds Saw & Steel Co. and Kellogg Structural Steel Co.
200 tons, addition to Gilchrist department store, Boston, to New England Structural Co.
191 tons, storehouse for the Erie railroad at Hornell, N. Y., to Jones & Laughlin Steel Corp.
180 tons, Meekins Packers building, Springfield, Mass., to Stafford Iron Works.
150 tons, Saint Thomas Acquinis church, Bronx, N. Y., to McClintic-Marshall Co.
148 tons, building for Hoyt Metal Co., Granite City, Ill., to the Mississippi Valley Structural Steel Co.
115 tons, boiler house for Otis Elevator Co., Quincy, Ill., to unnamed fabricator.
100 tons, building for the A. E. Staley Mfg. Co., Decatur, Ill., to Mississippi Valley Structural Steel Co.
Tonnage unnamed, transmission tower work, to Riter-Conley Co.

STRUCTURAL CONTRACTS PENDING

5000 tons, Liberty bank building, Buffalo; plans out.
5000 tons, Statler hotel, Boston; plans out.
4000 tons, additional unit for Western Electric Co. plant at Kearney, N. J.; pending.
2500 tons, bridge for city of Springfield, Mass.; bids close March 25.
2000 tons, Medico-Dental building, Post and Mason streets, San Francisco; bids in.
1500 to 1800 tons, viaducts, Buffalo, N. Y.; pending.
1300 tons, station for the Albany garage, Albany, N. Y.; steel contract placed with Levering & Garrigues Co. a month or so ago, it is now learned, has been canceled. The building will be built of reinforced concrete, contract for which has been placed.
1200 tons, addition to warehouse garage of Bloomingdale Bros., New York; pending.
1200 tons, transit sheds at Los Angeles; bids in March 21.
1000 tons, coal pocket for New England Fuel & Transportation Co., Boston; bids in.
965 tons, school No. 77 Bronx, noted some time ago as one of several schools to be closed on March 7 and 11; likely will be readvertised.
800 tons, First National bank building, Hammond, Ind.; pending.
750 tons, bridge at Hancock, Me.; bids in.
750 tons, office building for Northern Union Gas Co., Bronx, N. Y.; pending.
700 tons, Schwartz loft building, 7-9 West Thirty-sixth street, New York; pending.
700 tons, apartment house, at Nineteenth and Walnut streets, Philadelphia; contract about to be closed.
650 tons, Benner loft, 150-56 West Thirty-first street, New York; to be placed immediately.
650 tons, buildings for Pennsylvania state highway department; Shoemaker Bridge Co. low bidder.
500 tons, addition to school No. 28, New York; general contractors' bids close March 25.
400 tons, bridge for Chesapeake & Ohio, at Dayton, Ky.; bids asked.
400 tons, Washington school auditorium, Indiana Harbor, Ind.; bids in.
400 tons, addition to school No. 97, New York; noted in a previous issue, likely will be readvertised.
360 tons, Whitman loft at West Twenty-sixth street, New York; steel to be placed through Mark Eidletz.
340 tons, addition to West High school, Washington; pending.
300 tons bank for Landon estate, Fifth avenue near Fifty-fifth street, New York; pending.
300 tons, mill addition for Oxford Paper Co., Rumford Falls, Me.; pending.
250 tons, Carlisle department store, Ashtabula, O.; plans being revised.
250 tons, bridge for Atlantic Coast Line in Georgia; bids asked.
250 tons, boiler house for Gillette Safety Razor Co., Boston; bids in.
250 tons, State Street Trust Co. addition, Boston; bids being taken.
200 tons, building for Haines Jones & Cadbury, Wilkesbarre, Pa.; Sheperd Construction Co., general contractor.
125 tons, Illinois Central railroad bridge works, Chicago; pending.
100 tons, crane runways for Industrial Engineering Co., Chicago; bids in.
Tonnage unstated, addition to Rockford National bank, Rockford, Ill.; bids in April 10.
Tonnage not stated, Lion Dry Goods Co., Toledo, O.

Car Buying Is Revived

Louisville & Nashville Closes on 3900, Southern on 2000 and Nickel Plate on 1300—Rail Buying Light—Track Accessories Moderate

RAILROAD TRACK MATERIAL PRICES, PAGE 765

Chicago, March 18.—Approximately 8000 railroad freight cars, involving the use of probably 80,000 tons of finished steel, excluding the trucks, were placed in the past week. The Louisville & Nashville awarded a total of 3900, the Southern 2000, and the Nickel Plate 1300, to say nothing of the repairs to 2095 cars placed by the Illinois Central. In a few days the Missouri Pacific probably will award 1000 automobile cars to the Pennsylvania Car Co. A steel interest places car awards so far this year at 75,000. The freight cars placed with Chicago district builders in the past 10 days are sufficient to extend their backlog at least a month, giving local builders sufficient work on the average to keep them going through Oct. 1.

While no large orders for track fastenings were placed last week the aggregate of medium-sized orders has been high. The leading maker has taken 10,000 kegs of spikes, 8000 kegs of bolts, 5000 tons of tie plates and 4500 tons of angle bars. These fastenings are believed going largely to railroads which placed their rail business three or four months ago and now require the necessary fastenings.

Only a few small miscellaneous lots of steel rails were placed here in the past week. Light rails are inactive and nominal at 2.25c, mill.

Car Buying Again Heavy

New York, March 18.—Freight car orders last week involved close to 8000 cars. Of this number, 4000 were for the Louisville & Nashville, 2000 for the Southern and 1300 for the Nickel Plate. Substantial locomotive business also has been placed. The Union Pacific has closed on 43 locomotives, 28 heavy mallet type and five mountain climbing type to be built by the American Locomotive Co. and 10 freight hauling type by the Baldwin Locomotive Works. The Nickel Plate ordered 10 Mikado type locomotives and 10 switch engines from Lima Locomotive Corp., while the Atlantic Coast Line placed 20 Pacific type locomotives and five switch engines with the Baldwin Locomotive Works. This latter company also booked three switch engines for the Utah Copper Co., one Consolidated type locomotive for the Tennessee, Alabama & Georgia, and one for the Thomsen-Clark Timber Co. Ltd. Included in new inquiry are 10 locomotives for the Rock Island and six electric locomotives for the Southern Pacific.

Books 51 Locomotives

Philadelphia, March 18.—Baldwin Locomotive Works has booked 25 locomotives for the Atlantic Coast Line, 10 for the Union Pacific, six for the International Great Northern, five for the Southern and five for the Reading. Some of these roads have purchased only a portion of their recent inquiries. The Rock Island is inquiring for 10.

Light Rail Demand Colorless

Pittsburgh, March 18.—Light rail business continues colorless. Coal mining operations are not being extended and since the coal industry is the largest consumer of light rails, the orders have been practically nil. Only small orders are placed and competition is decidedly keen. The usual closing prices are from 2.00c to 2.15c base Pittsburgh, although some 2.25c quotations still are out and some lower figures than that minimum have appeared.

Track fastenings manufacturers are well filled up for the first half although no outstanding orders have been placed here for either standard spikes or tie plates. On the former 3.05c, base Pittsburgh, is quoted and on the latter $52 per ton. Small spikes sold by the leading maker carried a 3.25c price but independents claim they still are able to obtain 3.50c, base Pittsburgh, on the small lots which they are sending out.

Large Locomotive Orders Placed

Cleveland, March 18.—The Nickel Plate railroad has distributed its recent inquiry for locomotives, 10 Mikado and 10 switch engines going to the Lima Locomotive Works. The Louisville & Nashville railroad has placed 30 locomotives with the American Locomotive Co. It develops that the portion taken by the Inland Steel Co. of Clover Leaf rail order, reported last week, is 2000 tons.

CAR ORDERS PLACED

Skelly Oil Co., Tulsa, Okla., 35 insulated 8050-gallon tank cars, to Standard Tank Car Co., Sharon, Pa.
Southern railroad, 2000 freight cars, 1200 gondolas to the Standard Steel Car Co. and 800 hoppers to Chickasaw Shipbuilding & Car Co.
Nickel Plate, 1300 cars, 1000 automobile box to the Illinois Car Mfg. Co. and 300 stock to General American Car Co.
Illinois Central, repairs to 1000 box cars, to Illinois Car & Mfg. Co. and repairs to 900 box and 195 flat cars, to the Pullman Co.
Great Northern railroad, 50 express refrigerator cars, to the Siems-Stemble Co.
Canadian National railways, 35 miscellaneous coaches and 50 cabooses to the Canadian Car & Foundry Co. and 20 baggage cars to the National Steel Car Co.
Atlantic Coast line, 50 ballast cars and 33 caboose underframes to the Virginia Bridge & Iron Co.; and 17 express and mail cars to the Standard Steel Car Co.
Nickel Plate railroad, 1000 automobile cars to the Illinois Car Mfg. Co. and 300 stock cars to the General American Tank Car Corp.
Louisville & Nashville, 3900 freight and 34 to 44 miscellaneous cars, allocated as follows: 1100 gondolas, 500 automobile and 14 baggage mail cars to Pressed Steel Car Co.; 1150 50-ton box, 500 auto box and 150 flat cars, to Chickasaw Shipbuilding & Car Co.; 500 box cars, to Mt. Vernon Car Mfg. Co., 20 to 30 coaches, to American Car & Foundry Co.
Norfolk & Western, rebuilding 1050 steel gondolas, 750 to Ralston Steel Car Co., and 300 to Virginia Bridge & Iron Co.
Southern railroad, 20 coaches to Bethlehem Shipbuilding Co., 20 baggage mail to American Car & Foundry Co. and five diners to the Pullman Co.

CAR ORDERS PENDING

American Smelting & Refining Co., 15 ore cars, pending.
Nickel Plate, seven miscellaneous coaches; bids asked.
Rock Island railroad, 8 diners and 5 pullman cars; pending.
Western Fruit Express, 1000 underframes; pending.
Bessemer & Lake Erie railroad, 12 baggage, mail and passenger coaches; pending.
Missouri Pacific railroad, 1000 automobile cars, Pennsylvania Car Co. low bidder.
Chesapeake & Ohio, 3000 steel hopper-bottom gondolas, 2000 auto box cars and 600 Hart ballast cars; pending.

The Nonferrous Metals

London Metals Break Sharply—Copper in Domestic Market Resists in Part but Others Lower

	Copper—Electro delivered	Copper—Lake delivered	Spot tin Straits New York	†Lead New York basis	Zinc St. Louis basis	Spot† aluminum	Spot antimony	Spot nickel
March 12....	14.00	14.25	58.50	9.50	6.55	28.00	11.25	29.00
March 13....	14.00	14.25	57.00	9.50	6.52½	28.00	11.25	29.00
March 14....	14.00	14.12½	56.50	9.37½	6.50	28.00	11.25	29.00
March 17....	14.00	14.12½	56.50	9.37½	6.50	28.00	11.25	29.00
March 18....	14.00	14.00	52.50	9.25	6.40	28.00	11.25	29.00

†Outside market quotation.

NEW YORK, March 18.—Coincident with the news that American and British bankers were extending financial aid to France, the London metal markets last Thursday broke sharply and repeated the action today. Declines extended from £2 to £34 in tin. There was no news at first to account for the declines, but it developed that German speculators were caught short on francs and had to sell metals.

American producers of copper, zinc and lead have stood relatively firm. Nevertheless, the market has lapsed into exceeding dullness, with both buyers and sellers waiting for developments.

Electrolytic copper has been maintained at 14c to the domestic trade, but export prices are weak after resistance. It was a question whether the American price would decline to invite foreign buying or whether foreign prices would have to come up to the American level. Outside market prices declined ⅜ cent to 13.62½c refinery; casting dropped to 13.37½c.

Fully 3000 tons of zinc sold for export last week. Joplin district mines closed Monday for a week, following ore sales at $40 Saturday. The February statistics showed a decrease in smelter stocks of 3505 tons. Domestic galvanizing buying has remained slow, but smelters have not been pushing sales, waiting on their market. The price of prime western held at 6.50c and then dropped today to 6.40c East St. Louis, for prompt and April shipments.

Producers are quoting 9c New York, and 8.87½c to 9c St. Louis, for April and May shipment lead. Prompt lead is in light demand, but on such inquiries as appear, premiums are asked, up to 9.25c New York, 9.12½c, St. Louis. The London lead market has dropped £5 in the past week.

The tin market has been the target of bear operators this week, some strong factors, reported to be led by Ricard, have been selling heavily from the high of £299 10s reached for spot Straits March 1. Prices here have declined accordingly, about 6 cents a pound. The activity of the bears in London has been aided by the lack of any buying interest on this side, as consumers here have been out of the market.

The outside aluminum market has held steady at the new prices of 28c for 98 to 99 per cent and 29c for 99 per cent established with the recent advance by the domestic producer of 1 cent a pound, to 27c and 28c, respectively. New business has been light, but some second half contracts in foreign ingot have been made at 28c, delivered, for 98 to 99 per cent.

The antimony market has been dull and a shade easier at 11.25c, duty paid, for spot metal.

Mill Products

Base prices cents per pound, f.o.b. mill

SHEETS	
Copper, hot rolled, 4 oz., min..	21.75
High brass	18.25
Zinc, ga. 9 to 18 (plates ½c less)	9.75
Lead, full sheets (cut ¼c more).	12.50
Aluminum, base 18 ga. and up...	36.40
SEAMLESS TUBES	
High brass	22.50
Copper	23.75
RODS	
High brass, round, ⅜ to 2½-inch	16.00
Naval brass rods	18.75
WIRE	
Copper	16.00 to 16.50
High brass	18.75

Old Metals

Dealers' buying prices cents per pound

HEAVY RED BRASS	
Cleveland	9.50
New York	8.75
Chicago	9.00
HEAVY YELLOW BRASS	
New York	5.75 to 6.25
Chicago	7.00
Cleveland	6.50
ZINC	
New York	4.00 to 4.50
Cleveland	4.25
Chicago, dross	4.75
HEAVY COPPER AND WIRE	
Cleveland	11.00
New York	10.75
Chicago	10.75
RED BRASS TURNINGS	
New York	7.75
Cleve'and	8.50
Chicago	8.50
YELLOW BRASS TUBING	
Cleveland	6.00
NO. 1 BRASS ROD TURNINGS	
Cleveland	6.25 to 6.50
New York	6.75 to 7.00
Chicago	6.75
ALUMINUM BORINGS	
Cleveland	12.50

Fluorspar Brings $21

Pittsburgh, March 18.—A few single carload orders for fluorspar have been booked and where it has been possible to furnish car numbers $21 f.o.b. Kentucky mines has been done. Orders could probably be placed at $20 but delivery would be problematical.

To Improve Pueblo Works

According to J. F. Welborn, president, Colorado Fuel & Iron Co., the company's plans for improvements at Pueblo provide for the installation of electrical precipitators for cleaning blast furnace gas and the erection of a new power plant which will make it possible to electrify the drives of some of the rolling mills. No immediate extensions to the mills are contemplated.

The first unit of the electrical gas cleaning apparatus was inspected by a group of eastern blast furnace operators on Dec. 17 and 18, 1923, their visit to Pueblo having been reported in the Jan. 10, 1924, issue of IRON TRADE REVIEW. Six precipitators will be used on each furnace.

By-products Demand

On Contracts Continues Good—New Spot Business Light

New York, March 18.—The coal tar by-products market continues steady. Prices are unchanged while demand apparently is at about the same rate as in the preceding two weeks.

Trading in sulphate of ammonia is the least active. Sellers assert there is little buying in either foreign or domestic quarters and there are virtually no new inquiries. The Japanese inquiries noted early in February have not been closed. Due to the volume of production going into contract business few supplies are available. This fact accounts for the continued steadiness of prices.

Quotations on light oil distillates are as follows: Pure benzol, 25 cents works, in tanks and 30 cents in drums; 90 per cent benzol, 23 cents in tanks and 28 cents in drums; solvent naphtha, 25 cents in tanks and 30 cents in drums; toluol, 26 cents in tanks and 31 cents in drums; and xylol, 28 cents works in tanks and 30 cents in drums. A scarcity still prevails in toluol and solvent naphtha, sellers in some instances having difficulty meeting in their shipment schedules.

While manufacturers of phenol continue to book contract business around 28 cents, works, the majority are not in position to handle spot business. Consumers are forced to turn to the outside market where scattered lots are available for immediate delivery around 38 cents, storage. Demand as a whole, however, is of a routine character. Naphthalene may be quoted at 6 cents, works, for flakes and 7 cents for balls.

Coke Oven By-Products

Spot*

Per Gallon at Producers' Plants in Tank Lots	
Pure benzol	$0.25
Toluol	0.26
Solvent naphtha	0.25
Commercial xylol	0.28
Per Pound at Producers' Plants	
Phenol	0.38
Naphthalene flake	0.06
Naphthalene balls	0.07
Per 100 Pounds at Producers' Plants	
Sulphate of ammonia	$2.70 to $2.75
Contract	
Pure benzol	Nominal
Toluol	Nominal
Solvent naphtha	Nominal
Commercial xylol	Nominal
Per Pound at Producers' Plants	
Phenol	$0.28
Naphthalene flakes	0.06
Naphthalene balls	0.07

*Spot distillates are subject to shading.

Parched Coast Is Dull

California Feels Effect of Unusual Drought in Lessened Country Buying—Building Operations—Belgian Rails Sold

SAN FRANCISCO, March 12.—Activity in iron and steel products is reflecting the prolonged drought throughout California. While building construction in the larger cities is being well maintained, falling off in demand from the country trade is noticeable. Keener competition has resulted in further price recessions and consumers are hesitating to place orders.

February building permits in San Francisco were the highest in the history of the city, 794 permits being issued with a valuation of $3,912,166, compared with $3,278,676 in February, 1923. Bank clearings for the past month totaled $663,500,000, an increase of $78,100,000 over February of 1923. Building operations in Los Angeles have kept a steady pace and including Feb. 26 permits for 4776 structures had been issued at an estimated valuation of $14,782,727.

Pig Iron and Coke

Trading in pig iron and coke is mostly in small spot lots. The Southern Pacific Co. has closed on 500 tons of No. 2 southern and 500 tons of foundry coke from domestic interests. A sanitary ware manufacturer in the southern part of the state has closed on 1000 tons of continental iron at a price reported to have been $25 duty paid San Pedro. Scotch iron, running high in silicon and under 0.3 in phosphorus is being quoted at $30.50, duty paid San Francisco, while spot lots continue to bring around $34. One local bar mill interest recently asked for figures on 5000 tons of rerolling billets and received a quotation of $25.74, Antwerp, which with duty of $6.72 a ton and water freight was equivalent to about $38 delivered. This figure was too high and the inquiry was dropped.

Bar, Plates and Shapes

February bar booking showed an increase over January, although the volume is not entirely satisfactory. Concrete bar demand is much heavier than for merchant quality. The Columbia Steel Corp. is operating three open-hearth furnaces, the Judson Mfg. Co. two and the Pacific Coast Steel Co. three. Larger awards of reinforcing material this week totaled over 900 tons, 700 tons being secured by Edw. L. Soule Co. for the Pacific Telegraph and Telephone Co. building in San Francisco. Pending business is well in excess of 4000 tons. Numerous smaller contracts are being taken.

Bolt, nut and rivet demand is holding well, but prices are weak. While 60-10 off is being done on contract for the rest of this quarter, some manufacturers are now naming 60-5 off on new business. Structural rivets are generally quoted at 2.75c, base Pittsburgh, 2.90c having disappeared entirely. On small rivets 65-10-5 off is supposed to be the market but 70-10 off is freely quoted.

Little new plate business is developing on the coast. Demand for oil storage tanks has entirely disappeared. The Southern Pacific Co. has closed on 650 tons of universal plates. Bids were opened in Portland, Oreg., March 15 for a dredge hull involving 400 tons. Prices here are general at 2.80c c.i.f. San Francisco, while 2.70c is reported as having been received in the Northwest.

Much structural work remains unplaced, over 9000 tons being up for figures. Fabricators find a good volume of smaller business coming in. Prices have eased off and while 2.85c coast ports is being done for carload business, 2.80c is being named for more desirable tonnages.

Other Finished Material

Improvement in demand coming in for oil country goods is reported by eastern mill representatives in this district, while distributors are actively seeking tonnages of standard merchant pipe. At the moment no large inquiries for line pipe are before the trade.

Municipal awards of cast iron pipe this week totaled over 50 tons. Demand from private sources is only fair. Some heavy tonnages are pending, the total being well in excess of 16,000 tons, largest among which is 7361 tons for Santa Monica, Cal.

About 100 tons of 60-pound Belgian rails have been made here and at Vancouver at £7 18s c.i.f. and 250 tons of Belgian angle bars were sold at £9 10s, c.i.f. San Francisco.

Northwest Building Brisk

SEATTLE, March 12.—The turnover of iron and steel is normal for the season. Business conditions are generally satisfactory, the volume being somewhat greater than at this period last year. Several large contracts here and in Oregon are pending although most buying consists of small tonnages. Voters of Seattle yesterday approved for the second time bond issues of $1,500,000 and $500,000 respectively for the Spokane and Montlake bridges. Washington has just awarded five projects involving 33 miles of road to cost $450,000, Oregon has ordered 9½ miles of concrete paving to cost $225,000 and Idaho has approved three projects to cost $225,000.

Industrial peace in Seattle building trades appears assured for another year by the approval of the existing wage scale now in effect until May 1.

Specifications for the proposals for the Lake Cushman power project, to be opened by Tacoma officials April 16, include two hydraulic turbines, vertical type, 27,500 horsepower maximum capacity at 260-foot head; two electric generators, vertical type, rated at 20,000 kilovolt-amperes and auxiliaries. transformers, oil purifiers, oil testing sets, auxiliaries and spares; also one electric synchronous condenser and auxiliaries. Bremerton, Wash., is planning construction of a steel bridge to cost about $250,000.

Pig Iron and Coke

The trade is watching the trend of the continental market which has recently advanced 6 shillings. While United Kingdom iron remains stationary that market is firm and importers would not be surprised if quotations went up. The trade here has covered itself for second quarter as to certain grades of Scotch iron and some buying has been done for July delivery. During the week orders for low grade foreign iron have been placed with local importing houses. This material originates in Belgium and France and is being used to take the place of local cast iron scrap. Foundrymen are not pleased with the scrap market and are buying cheap continental iron instead. This is being landed here at about $26.50. It is lower in silicon content and higher in phosphorus than high grade British and Scotch iron used generally in this territory. There is no change in the coke situation.

Bars, Plates and Shapes

The local mill is operating almost to full capacity with considerable tonnage on books. Demand for bars continues strong. Small shapes move in fair volume while the turnover of plates is satisfactory. From 1500 to 1800 tons of shapes will be required for the Burnside bridge, Portland, Oreg., on which bids close April 1. Little interest in American bars is manifested by buyers in Japan and China, prices being out of line with quotations made by European manufacturers.

Prices remained unchanged with the exception of shafting on which a revision of extras was necessitated by changes announced by the mills effective March 10. The base price remains the same.

Old Materials

Cast iron scrap is weaker, due to the reaction of buyers following the recent rise in prices. Cast iron has sold as low as $19 within the last week although dealers are trying to hold the price at $22, the level of several weeks.

There is no change in steel scrap. Supplies are arriving in fairly liberal quantity, the prevailing price remaining at $10 and $10.50 per gross ton.

Bethlehem Income High

Earnings of $275,213,422 in 1923 Show Good Increase Over 1922—Results of Combination Are Discussed

SHIPMENTS and deliveries for subsidiary companies of $275,213,422 for the year ending Dec. 31, 1923 are reported by the Bethlehem Steel Corp. in its nineteenth annual statement. This compares with shipments and deliveries to the value of $131,866,111 for the preceding year. Net income for the year after providing $10,676,078 for depreciation and depletion was $14,374,152 an increase of $9,768,821 over 1922.

After paying dividends of $12,085,327 there was a surplus of $2,288,824 for 1923 as compared to a deficit of $2,332,685 in 1922. The consolidated balance sheet, as of Dec. 31, 1923, which is the first issued by the corporation since its purchase of the properties of the Midvale Steel & Ordnance Co. and of the Cambria Steel Co. show current assets of $162,450,819 against current liabilities of $42,726,646. The current assets include $36,266,469 in cash and United States government and other marketable securities, and $89,805,202 in raw materials, supplies and work in progress. Current liabilities include $9,630,000 in notes payable, $30,185,404 in accounts payable, and $2,911,241 in accrued bond interest. The comparative income account follows:

	1923(a) Amount	1922(b) Amount
Gross sales and earnings	$275,213,422.65	$131,866,111.39
Manufacturing cost, administrative, selling and general expense, and taxes	239,115,639.82	114,957,170.61
Net operating income	$36,097,782.83	$16,908,940.78
Interest, dividends and other miscellaneous income	1,275,445.17	2,884,771.92
Total income. Int'st charges, including proportion of discount on, and expense of, bond and note issues	$37,373,228.00	$19,793,712.70
	12,322,997.53	5,689,193.32
Balance	$25,050,230.47	$14,104,519.38
Provision for depreciation, obsolescence and depletion	10,676,078.25	6,499,188.84
Net income	$14,374,152.22	$4,605,330.54

(a) Includes the results of the operations of the properties acquired from Cambria Steel Co. and Midvale Steel & Ordnance Co. after March 30, 1923.

(b) Includes the results of the operations of the properties acquired from Lackawanna Steel Co. after Oct. 10, 1922.

The report includes for the first time a statement showing the growth of the corporation through the cash expenditures for additions and improvements and the acquisition by purchase of new properties. This statement shows that since 1905 cash expenditures of $279,587,159 have been made, including $19,914,660 which was spent during the past year. The estimated cost of completing construction in progress on Dec. 31, 1923, is $13,550,000. The original cost of properties purchased since 1905, after deducting depletion and amortization at date of acquisition, was $386,785,626. The statement by Chairman Schwab and President Grace to the stockholders says in part:

"The outstanding problems of your corporation during the year have been the co-ordination of the raw material properties, transportation facilities and producing units acquired from the Lackawanna, Midvale and Cambria companies with the other Bethlehem properties, and the realignment of administrative and operating organizations, together with the formulation and execution of commercial policies to meet the new conditions created. Much has been accomplished, but it will naturally require some time before the full benefits can be realized from the consolidation of the properties.

"The early part of the year 1923 was characterized by an unusually large demand for steel products requiring capacity operations for some months. The demand materially lessened during the second quarter, reaching a low point in the late summer, since which time there has been a gradually increasing demand, each succeeding month since August having shown an increased volume of new business for your corporation.

"The value of orders booked during the year, including $25,261,000 of orders on the books of Midvale Steel & Ordnance Co. and Cambria Steel Co. on the date of the acquisition of their properties, aggregated $260,968,326 as compared with $149,211,499 for the year 1922. The unfilled orders on Dec. 31, 1923 amounted to $53,264,911 as compared with $67,510,007 on Dec. 31, 1922.

"The depression in the shipbuilding industry continued throughout the year. The volume of ship repair work, however, was in excess of that for the previous year and established a record for the plants of your corporation. The prospects for this work for the coming year are good. In addition there are new prospects in the line of equipping present steam propelled vessels with the Bethlehem oil engine.

"One of the important developments of the year was the elimination of the 12-hour work day for employes of your corporation, which was practically effected during the last half of the year. Although it has increased the cost of producing steel the change will undoubtedly prove socially and industrially beneficial."

The average number of employes of the corporation in the United States in 1923 was 62,350 with aggregate payrolls of $111,457,462. This compared with 33,816 employes and payrolls of $50,376,677 in 1922. The average earnings per hour for all employes were 58.8 cents against 49.9 cents in 1922.

The report officially gives the total capacity of the various plants comprised in the corporation as 6,610,000 tons of pig iron and 7,600,000 tons of steel ingots annually.

Orders received and on hand over a period of years are given as follows:

Year ended	Received	On hand
Dec. 31, 1905	$29,020,424	$14,466,307
Dec. 31, 1906	16,216,570	13,300,885
Dec. 31, 1907	23,602,858	8,425,737
Dec. 31, 1908	15,849,409	7,592,503
Dec. 31, 1909	28,696,517	14,073,834
Dec. 31, 1910	29,530,563	17,370,660
Dec. 31, 1911	28,607,561	15,885,198
Dec. 31, 1912	47,030,504	29,282,182
Dec. 31, 1913	39,935,874	24,865,560
Dec. 31, 1914	69,163,720	46,513,190
Dec. 31, 1915	275,433,500	175,432,895
Dec. 31, 1916	234,225,909	193,374,249
Dec. 31, 1917	559,364,041	453,808,759
Dec. 31, 1918	323,548,116	328,946,066
Dec. 31, 1919	204,118,387	251,422,545
Dec. 31, 1920	168,295,328	145,286,637
Dec. 31, 1921	52,672,334	50,164,619
Dec. 31, 1922	149,211,499	67,510,007
Dec. 31, 1923	260,968,326	53,264,911

Earnings of Otis Steel Co. Show Large Gain

The Otis Steel Co., Cleveland, earned a profit of $1,360,893 in 1923, compared with a loss of $427,659 in 1922. Earnings were sufficient to pay two years dividends on preferred stock, disbursements on which have been suspended for some time. The annual report of the company shows current assets of $9,533,756 against $4,214,393 of current liabilities.

The operating profit before allowance of $350,000 for depreciation totaled $1,710,893 compared with $427,659 the year before. The company's statement says that departments in all plants except the Riverside plate mill were practically in full operation throughout the year and all made a profit. The plate mill, idle since August, 1921, because of unfavorable market was started last December. The comparison follows:

ASSETS

	1923	1922
Cash	$ 377	$ 4,513
United States government securities	.....	1,675,070
Notes receivable	40,670	73,941
Accounts receivable	2,647,602	1,887,694
Inventory	6,845,105	5,007,152
Current	$ 9,533,756	$ 8,648,374
Invested in other companies	1,472,324	1,559,554
Personal notes	67,774	65,976
Certified deposits for construction purposes	.....	4,341,577
Property account	24,314,659	17,056,778
Deferred	1,485,339	1,489,240
Totals	$36,873,854	$38,161,502

LIABILITIES

Notes payable	$ 800,000	.....
Accounts payable	3,414,393	$ 1,764,881
Current	$ 4,214,393	$ 1,764,881
Deferred	50,461	166,647
First mortgage bonds A	4,718,000	5,000,000
First mortgage bonds B	4,844,000	5,000,000
Reserves	754,994	641,285
Preferred stock	8,830,600	8,830,600
Common shares at $5	3,705,010	3,705,010
Surplus, reorganization	6,879,637	6,879,637
Profit and loss	2,876,757	1,173,439
Totals	$36,873,854	$38,161,502

Sales to Japan Increase

Good Steel Tonnages Placed in United States, though Exporters Doubt Large Buying Movement—Foreign Trade Improves

NEW YORK, March 18.—Japanese steel demand in this country has improved materially, although it is too early to say whether a buying movement has begun. Those best informed say the situation in Japan with respect to steel supplies does not justify expectations of any large amount of Japanese business at this time. The Mitsubishi firm has distributed orders with American makers for 650 tons of rails and accessories for the Okasaki electric railway and 250 tons for the Aichi electric railway. Bids now are being submitted on about 1100 tons of 100-pound titanium rails for 6½ miles of track for the Keihin tramway between Tokio and Yokohama, and on 250 tons of 40-pound rails for 2½ miles of track in Formosa.

The imperial government railways of Japan have not yet taken action on about 600 tons of sheet piling. A new inquiry calls for about 800 tons of structural material for the Dairen Kikai Seisakusho. An inquiry is out for 600 tons of gas pipe for Tokio. Two inquiries are pending for wire rods for Japan. Included in orders booked during the past week were several tonnages of heavy-gage black sheets.

On the whole, export business is fairly good. The United States Steel Products Co. is booking an average of 8000 tons a day, including 1000 tons of tubular goods. In the business booked by this company during the past week were 2000 tons of rails and various products for Cuba, 1500 tons of girder rails for Buenos Aires, Argentina, 600 tons of girder rails for Brazil and 950 tons of track accessories for the Chilean state railways. The bulk of miscellaneous business from South America, Cuba and the British West Indies comprises wire products and nails, tin plate, concrete bars and some sheets, the total representing a fair tonnage.

Exporters view with satisfaction the rise in the exchange value of francs and believe that if this continues, it ultimately will divert to this country a good amount of export business which now is going to Europe. Generally, European prices continue materially below those quoted by American mills. American mills quote about $58, c.i.f. Kobe, on plain structural material, and while the Americans might accept less, they could not meet the European price which is at least $10 lower.

English tin plate prices have stiffened due largely to the advance in the price of pig tin, but they still are considerably under the Americans quotations. British tin plate has been sold in boxes of 108 pounds at the equivalent of $5.84, c.i.f. Kobe, whereas the American price ranges from $6.20 to $6.25, Kobe. On 24-gage black sheets an American mill quoted around $86.35 per gross ton, c.i.f. Tokio, while the European price is about $12 lower. American blue annealed sheets have been quoted at $80.50, c.i.f. Kobe. Wire rods are quoted at $54 to $57, Kobe. Concrete bars for export are held at 2.00c, base Pittsburgh, although bars of other than new material have been sold at less. British soft bessemer bars have been sold at £11 10s ($49.45) c.i.f. Far Eastern ports, and British tank plates have been offered at £11 15s ($50.52). Belgian plates have been offered in the same ports in some cases at £10 ($43).

Considerable weakness has characterized export prices generally, but particularly the prices on wire and wire products. Nails, galvanized wire and barbed wire all have been sold at 3.00c, base New York. These low prices have been withdrawn in some cases and the indications are that the market may firm up to 3.10c on galvanized wire and 3.15c on nails and barbed wire.

Serious congestion continues at the ports of Yokohama and Kobe and it is reported that 120 ships now are at the former port endeavoring to unload. The warehouses and sheds are filled and material is being unloaded wherever space is available, while large quantities of material, particularly steel and lumber, continue to arrive.

Foreign Sales Are Small

New York, March 18.—Sales of European steel continue to be made to consumers in this territory but there is a lack of large tonnages. As a matter of fact, total sales of European steel in this territory during the past week aggregated less than 1000 tons. This business comprised principally plain shapes and steel bars. Several lots already have been received from abroad and the steel has proven satisfactory.

Producing Black Sheets

Officials of the Waddell Steel Co., Niles, O., now include J. D. Waddell, president and treasurer; Robert L. McCorkle, vice president; M. A. Jones, secretary; and C. B. Rettig, manager of sales. The Waddell Steel Co. several weeks ago, acquired the Empire works of the Youngstown Sheet & Tube Co., at Niles, including one 28 x 48-inch, one 26 x 40-inch, one 28 x 36-inch hot sheet mills and one 26 x 58-inch and two 26 x 48-inch cold sheet mills. While the plant is equipped for the manufacture of galvanized sheets the company will confine its output at present to the production of black sheets. Initial operation began with four mills, which schedule continues to be maintained.

Thomas Sheet Steel Will Modernize Its Mills

The Thomas Sheet Steel Co., Niles, O., which recently purchased the Thomas works of the Youngstown Sheet & Tube Co. has placed six hot mills under power, marking the initial operation since the plant was acquired. Blue annealed, galvanized and pickled black sheets will be produced. The plant at present includes one 28 x 48-inch, one 28 x 44-inch, two 28 x 40-inch and eight 28 x 36-inch hot sheet and one 26 x 58-inch and five 24 x 48-inch cold sheet mills. In the course of a few months the officials of the Thomas company plan to replace the six idle mills with a similar number of up-to-date units, switch production onto these mills and replace the six units now active with more modern equipment. Officials of the Thomas Sheet Steel Co. include Myron C. Summers, president; Severn P. Ker Jr., vice president in charge of sales; Claude R. Thomas, treasurer; and Frank Howell, secretary. Mr. Summers formerly was associated with the Canton Sheet Steel Co. in the sales department; was sales manager of the DeForest Sheet & Tin Plate Co., Niles, O., which was acquired by the Republic Iron & Steel Co. and before becoming identified with the Thomas company was sales manager of the Superior Sheet Steel Co., Canton, O. Severn P. Ker Jr. until March 1 was manager of sales for the Ashtabula Steel Co., Ashtabula, O. Frank Howell formerly was identified with the Superior Sheet Steel Co., the American Sheet & Tin Plate Co. and also the Inland Steel Co.

Underselling Imports

Washington, March 18.—Products of the South African Steel Equipment Co., at Johannesburg, South Africa, are underselling similar imported articles in some cases, a report to the department of commerce from the American trade commissioner at Johannesburg states. Among the products of this company are steel filing cabinets, similar to American articles of good quality.

European Mills Booked Heavily

German Competition Fills Ruhr Plants with Orders for Three Months—Operating Now at 60 Per Cent—French and Belgian Producers Covered for May and June —Basic Bessemer Sold for Delivery to Atlantic Coast

Iron Trade Review Staff Cable

2-3 Caxton House, Westminster, S. W.1
European Headquarters,
IRON TRADE REVIEW,

LONDON, March 18.—It is reported from Paris that a tonnage of basic bessemer pig iron has been sold for delivery to the American Atlantic coast at $24.75 c.i.f. duty paid. Paris also reports that the French and Belgian mills are booked through May and June, while export competition has subsided. Production in the Ruhr district during January totaled 336,000 tons of steel and 300,000 tons of pig iron . Indicating recent stronger German competition, information comes from Dusseldorf that operations in the Ruhr district average 60 per cent of capacity. The order books of the German producers in the district are filled for three months, and prices are advancing.

A report from Berlin states that wire nails are selling for £14 ($60) f.o.b. An order is noted for 3000 tons of barb wire for shipment to Brazil, taken at £16 5s ($69.63) f.o.b. A tonnage of oval fencing wire has been sold for delivery to South America for £21 ($89.98) c.i.f.

The British pig iron market is dull and prices are again declining, with more furnaces going out. Exports of British iron and steel products in February total 331,000 tons compared with 338,000 tons in January, and a monthly average of 355,000 tons for 1923. Imports of iron and steel products in January total 190,000 tons, compared with 140,000 tons in January and a monthly average of 111,600 tons for 1923.

Changes in British prices during the week bring the following products to the levels as quoted: Tin plate £1 4s 9d ($5.14); Middlesbrough No. 3 foundry iron £4 10s ($19.28); Derbyshire No. 3 foundry iron £4 14s 6d ($20.25); Northamptonshire No. 3 foundry iron £4 11s ($19.50); Staffordshire No. 3 foundry iron £4 14s ($20.14) and rails for export £8 10s ($36.42).

Sterling exchange is figured on a basis of $4.285.

Japan Faces Glut of Steel and Prices Topple

Foreign Special Service

TOKIO, Japan, Feb. 18.—The arrival of government reconstruction purchases from the United States and Great Britain which commenced in January is in full swing. At Yokohama and Kobe it has created serious congestion with increasing arrival of private purchases.

The board of reconstruction states the tonnage of iron and steel products at Yokohama and Tokio amounts to 4650 tons. This will grow several thousand tons a week for some months.

In view of the difficulty of importing all reconstruction purchases by the close of March the government has decided to renew the emergency tariff with changes. Among other things, iron and steel sheets, wire, rods, pipe and tubes, nails, rivets, screws, railway construction materials, electric poles, iron and steel products and materials used in building houses, bridges, roads and ships not otherwise mentioned, house fixturese, valves, meters, automobiles and their parts and telegraph and telephone apparatus will be free of duties for another year with the renewal of the tariff ordinance.

Yen—$0.475

The government and importers of reconstruction material are waiting without trying to sell new stocks now idly warehoused at Yokohama, Tokio and Kobe because iron and steel producers here have gone below original cost.

Some dealers find the decision to keep iron and steel free of duties another year a menace to them in many ways. The growing pessimism is reflected by the market which is dull and inactive.

In pig iron the price is shaded more freely by merchants who fear the stabilization of the exchange market may reopen the importation of Indian pig iron. No. 1 Japanese is offered at 64 yen ($30.40) per ton, a decline of 2 yen, as compared with last report. No. 2 Japanase is quoted at 61 yen ($28.97) per ton. No. 3 is even below 60 yen, being freely offered at 58 yen to 59 yen ($27.55 to $28.02). No. 1 Hanyang (Chinese) is quoted at 63 yen ($29.92) per ton. Bengal pigs are quoted at 60 yen ($28.50) per ton. Cleveland is nominally quoted at 78 yen ($37.05) per ton.

Steel prices threaten to go below the lowest points before the quake. Round bars are quoted at 4.20 yen ($1.99) per 10 kwamme. Flat and square bars are quoted at 4.70 yen ($2.23) per 10 kwamme. Sheets are quoted at 7 yen ($3.08) per 10 kwamme. Plates are staying on at 4.50 yen ($2.13) per 10 kwamme.

The decline of nails which are overstocked, is particularly fast. The average price this week is 12 yen ($5.70) per keg. In Osaka even at 10 yen ($4.75) they are freely offered. These figures are stated to be 3 yen to 4 yen below their original cost. Galvanized sheets are quoted at 1.20 yen ($0.57) per sheet but some weaker holders offer bulky lots at 1.15 yen ($0.54) per sheet.

Today's exchange is: Official rate yen 47.5 cents; open rate 45.5 cents. Kwamme equals 8.2673 lbs.

German Trade Improves with Finances

European Special Service

BERLIN, March 13.—Domestic and foreign business are both improving and if the general financial situation can be stabilized permanently the outlook is satisfactory. Exports are increasing although considerably below the 1922 average. Fair sales have recently been made to Japan and the East Indies, mainly bars at £6 15s to £7 (1.30c to 1.34c ped pound) f.o.b. Hamburg. These prices are considerably lower than those prevailing a month ago for German material. They indicate German prices are becoming competitive with those of France and Belgium. Considerable tonnages of bars are being shipped to Japan on old orders at about £8 (1.53c) f.o.b. Finland has been buying bars at £6 10s (1.25c), black sheets at £9 base (1.75c), and wire rods at £8 (1.55c) per metric ton. The price on sheets is exceptionally low but special concessions have been given to the Bal-

Current Iron and Steel Prices of Europe

Last Reported Prices Converted into Dollars at Rates of Exchange, March 17

British Market

Corrected to Date by Cable

Home Market Prices. Gross Tons at Works or Furnace

	$	£ s d
SEMIFINISHED STEEL		
Billets, soft steel	32.14	7 10 0
Sheet bars	32.14	7 10 0
Wire rods	47.14	11 0 0
FINISHED STEEL		
Steel bars, England, ⅝ to 3-inch	40.71	9 10 0
Steel bars, England, ⅝ to 3-inch, for export	38.57	9 0 0
Plates, ship, bridge and tank, England	40.71	9 10 0
Plates, ship, bridge and tank, England, for export	38.57	9 0 0
Plates, ship, bridge and tank, Scotland	40.71	9 10 0
Plates, ship, bridge and tank, Scotland, for export	38.57	9 0 0
Beams, England	40.71	9 10 0
Beams, England, for export	36.42	8 10 0
Beams, Scotland	40.71	9 10 0
Beams, Scotland, for export	36.42	8 10 0
Sheets, black, 24 gage	55.71	13 0 0
Sheets, black, 24 gage, for export	57.85	13 10 0
Sheets, galvanized, 24 gage	79.27	18 10 0
Rails, 60 pounds and over	38.57	9 0 0
Rails, 60 pounds and over, for export	36.42	8 10 0
Tin plate, base box 108 pounds	5.14	1 4 9
Steel hoops	51.42	12 0 0
Steel hoops, for export	47.14	11 0 0
PIG IRON		
Hematite, East Coast, Mixed Numbers	21.43	5 0 0
Hematite, West Coast, Mixed Numbers	22.71	5 6 0
Basic, Middlesbrough	20.35	4 15 0
No. 3 Foundry, Middlesbrough	19.28	4 10 0
No. 3 Foundry, Derby, Leicester, Nottingham	20.25	4 14 6
No. 3 Foundry, Northamptonshire	19.50	4 11 0
No. 3 Foundry, Staffordshire	20.14	4 14 0
No. 3 Foundry, Scotch	21.43	5 0 0
Ferromanganese, 76 to 80 per cent	72.85	17 0 0
COKE		
Yorkshire furnace	6.00	1 8 0
Foundry	7.50	1 15 0
Foundry, for export	8.14	1 18 0

Where no separate export prices are given, same quotations apply to domestic and foreign business.

German Market

Prices Last Reported

	$	Pounds per metric ton (2205 lbs.)
PIG IRON		
Hematite	23.78*	5 11 0
Foundry, No. 3	19.93	4 13 0
Stahleisen, Siegen	22.07	5 3 0
Foundry, No. 1	20.35	4 15 0
Luxemburg Foundry, No. 3	18.00	4 4 0
COKE		
Lower Silesian furnace	7.28	1 14 0
Lower Silesian foundry	7.71	1 16 0
SEMIFINISHED STEEL		
Billets	25.92	6 1 0
Sheet bars	28.28	6 12 0
Wire rods	32.78	7 13 0
FINISHED STEEL		
Standard rails	30.42	7 2 0
Merchant bars	29.35	6 17 0
Structural shapes	28.92	6 15 0
Ship plates	32.78	7 13 0
Medium plates, 3 to 5 millimeters	35.99	8 8 0
Sheets, 1 to 3 millimeters	38.39	8 19 0
Tin plate, per box of 575 kilograms	6.43	1 10 0
Plain wire	42.85	10 0 0
Bands and strips	39.42	9 4 0

All prices are f.o.b. furnace or works.
*German prices now are quoted in pounds, sterling.

French Market

Prices Last Reported

	$	Francs per metric ton (2205 lbs.)
PIG IRON		
Hematite, Lorraine	23.56	475
Basic bessemer, Lorraine	19.10	385
Foundry, Longwy, No. 3, sand-cast	18.60	375
Foundry, Longwy, No. 3, chill-cast	19.10	385
Ferromanganese, 76 to 80 per cent	76.88	1,550
COKE		
French furnace	7.04	142
German furnace, f.o.b. frontier	7.12	143.5
French foundry	7.79	157
SEMIFINISHED STEEL		
Blooms	28.52	475
Billets	25.05	505
Sheets bars	25.54	515
FINISHED STEEL		
Standard rails	27.53	555
Merchant bars	28.27	570
Angles	32.49	655
Normal beams and profiles	32.49	655
Plates, ship and tank, 10 millimeters and thicker	31.74	640
Plates, bridge and tank, 5 to 10 millimeters	32.24	650
Sheets, black, 3 millimeters	34.22	690
Sheets, blue annealed, 2 millimeters	39.18	790
Shafting, cold-drawn, 40 to 60 millimeters	57.04	1,150
Bars, 2 per cent nickel steel	91.76	1,850

All prices are f.o.b. furnace or works.

Belgian Market

Prices Last Reported

	$	Francs per metric ton (2205 lbs.)
PIG IRON		
Basic bessemer, Belgian	17.30	420
Basic open-hearth, Belgian	18.13	440
Gray forge, Belgian	18.95	460
Foundry, No. 3, Belgian	19.16	465
Foundry, No. 3, Luxemburg	17.30	420
Foundry, No. 3, Lorraine	17.30	420
SEMIFINISHED STEEL		
Blooms	24.10	585
Billets	25.96	630
Sheet bars	26.99	655
Wire rods	37.08	900
FINISHED STEEL		
Standard rails	28.63	695
Merchant bars	31.93	775
Normal beams and profiles	30.93	750
Plates, 5 millimeters and thicker	34.46	835
Sheets, black, 3 millimeters	36.05	875
Sheets, galvanized, 1 millimeter	87.55	2,125
Plain wire	49.44	1,200
Galvanized wire	61.80	1,500
Wire nails	51.50	1,250

All prices are f.o.b. furnace or works.

tic states because of their reduced purchasing power owing to a crop failure. Reduction of German railroad freight rates 10 per cent March 1 is expected to accelerate business revival.

On the home market, steel prices are moving upward to some extent and there is a considerable revival of buying. Plants in the unoccupied area have united in a sales syndicate called the Rolled Products union (Walzeisenvereinigung). This combination has fixed the price for bars at 130 rentenmarks (1.40c) and ship plates at 150 rentenmarks (1.62c) per metric ton. A price agreement also has been made between mills rolling railroad material, effective until June. The Thyssen company has refused to enter this combination.

The Phoenix plants in Horde and Ruhrort have six of their twelve blast furnace stacks in operation. The mills of the same company in unoccupied territory are fully employed. Krupps, although hampered by shortage of cash, are asking 135 rentenmarks per metric ton for bars. Krupps expect to build a new electric steel works near the 111 water power plant in Bavaria outside the French zone of influence at an estimated cost of 50,000,000 gold marks ($12,000,000).

European Export Prices in Wide Variation

London, March 7.—A comparison of relative iron and steel export prices covering various commodities from several European producing countries shows the spread between British and continental prices. British quotations, however, are for basic open-hearth steel, while continental mills usually quote on basic bessemer steel, which is higher in phosphorus. Many consumers continue to buy British steel which they consider as being of a higher grade. Deliveries from England also are more dependable owing to the congested conditions still prevailing on the Belgian railways and at Antwerp.

French export prices for billets, bars, and beams are from 50 to 60 francs ($2.20 to $2.65) per ton higher than the home prices. Belgian export prices are about 10 francs ($1.38) per ton higher for billets, 35 francs ($1.35) higher for bars. 50 francs ($1.90) higher for beams, and 50 francs ($1.90) less for rails. The prices in dollars at current exchange, all f.o.b., follow:

	English	French	Belgian	German
No. 3 foundry pig iron, per ton	$20.50	$16.23	$16.23	$20.05
Billets, per ton	31.25	24.80	24.80	25.00
Rails, per ton	37.70	25.35	26.55	28.45
Bars, per pound	1.76c	1.25c	1.25c	1.26c
Beams, per pound	1.66c	1.19c	1.19c	1.26c
Ship plates, per pound	1.76c	1.30c	1.44c	1.41c

Kansas Court Case Remanded

United States Supreme Court Holds State Tribunal Should Pass on Section of Act Under Which Mine Union Officials Were Convicted for Calling Strike—Issue Involved in Decision Against Compulsory Arbitration

WASHINGTON, March 18.—Recent decisions of the United States Supreme Court with respect to labor union affairs, particularly the ruling last week in the case of the Kansas court of industrial relations that the provision of the state law prohibiting strikes by coal miners must stand or fall on the decision of the Kansas courts, gives an indication that the Supreme Court will not be hasty in upsetting state legislation affecting organized labor, if this legislation constitutes sound and beneficial public policy. The rights of states to enact sound labor legislation is upheld.

Whether this decision tends to encourage the enactment of more or less radical labor legislation by some states has been the subject of question, but it also is indicated that state legislatures will observe caution in their action on labor laws.

Howatt Case Involved

In declining to affirm the conviction of August Dorchy, the union official who was found guilty with Alexander Howatt, also an official of the United Mine Workers, of violating the Kansas court of industrial relations act, the Supreme Court was of the opinion that the Kansas courts first should determine whether the section of the act under which Dorchy and Howatt were convicted could be severed from those other parts of the act which the Supreme Court already had declared unconstitutional. If section 19 of the act, under which the mine union officials were tried, is found to be so interwoven with the compulsory arbitration features of the law already held invalid that it cannot stand alone, then the effect would be similar to this section being held invalid also.

The case grew out of the arrest, trial and conviction of the mine union officials for calling a mine strike in Kansas. Section 19 prohibits strikes in an essential industry affecting the public welfare and classifies coal mining as such an industry. The section prescribes a penalty of a fine not to exceed $5000, or imprisonment at hard labor, not to exceed two years, or both fine and imprisonment.

After the Kansas supreme court entered the judgment in this case, upholding the lower courts, the United States Supreme Court declared in the case of the Charles Wolff Packing Co. vs. Court of Industrial Relations, decided last year, that the system of compulsory arbitration as applied by the Kansas act is unconstitutional.

The question which resulted was whether section 19 of the industrial court act was not a part of the system of compulsory arbitration. The Supreme Court's opinion says:

"If so, there is no occasion to consider the specific objection to the provisions of that section. This court has power not only to correct errors in the judgment entered, but in the exercise of its appellate jurisdiction, to make such disposition of the case as justice may now require.

"In determining what justice requires, the court must consider changes in law and fact which have supervened since the judgment was entered. If section 19 falls as the result of the decision in the Wolff Packing Co. case, the effect is the same as if the section had been repealed without any reservation.

"A statute bad in part is not necessarily void in its entirety. Provisions within the legislative power may stand if separable from the bad. But a provision inherently objectionable cannot be deemed separable unless it appears both that, standing alone, legal effect can be given to it and that the legislature intended the provision to stand in case others included in the act and held bad should fall. Section 19 does not, in terms, prohibit the calling of strikes or influencing workingmen to strike. It merely declares that one who uses his official position, or his position as an employer, to 'influence, impel or compel violation of this or any of the provisions of this act, or any valid order of said court of industrial relations, shall be deemed guilty of a felony.' Most of the provisions of the original act are very intimately connected with the system of compulsory arbitration. Whether section 19 is so interwoven with the part held invalid that the section cannot stand alone, is a question of interpretation and of legislative intent. But it is an aid merely; not an inexorable command."

The Supreme Court's decision holds that the Kansas courts first should pass upon this question involved.

Has Its Best Year

The tonnage made and shipped by the United States Cast Iron Pipe & Foundry Co., in 1923 was the largest in the history of the company, according to the annual report to stockholders submitted by President N. F. S. Russell. Consequently the year was the most favorable in point of profits. The net profit for the year was $3,471,267 compared with $1,022,242 in 1922. Continued progress in the standardization of operations and solving other manufacturing problems growing out of the new deLavaud process is reported. The company reports current assets of $9,489,236 with current liabilities of $2,983,042. The outlook for 1924 is encouraging, according to President Russell, and the company has entered the year with satisfactory tonnages.

Car Shops Put on Men

Approximately 1500 shopmen of the St. Louis & San Francisco railroad, who were laid off Jan. 1, have returned to work. Besides regular maintenance work the Frisco line proposes to start building new cars at its Springfield, Mo., shops, which will represent an expenditure of $2,250,000, during the spring, summer and fall. This sum is from the budget of $5,500,000.

The Hammond & Jeffers car shops in the Chicago & Indiana Western railway yards in Brazil, Ind., will resume operations soon with a large force. The car shops have been closed for the past three months because of slack business, but Manager Jeffers announces the company now has considerable work.

Acquire Ore Lands

Birmingham, Ala., March 17.—With 500,000 acres of coal and ore lands in Walker, Winston, Calhoun and Jefferson counties, besides Dauphin Island, near Mobile, Ala., a port point, a corporation to be known as the Deep Water Coal Co. has been organized here. The authorized capitalization is $20,000,000. C. A. Meade, formerly vice president of the Dupont interests, is president, and L. B. Musgrove, prominent Alabama coal operator, vice president and chairman of the board. Headquarters are in Jasper, Ala., 40 miles from Birmingham.

The company will begin developing its coal lands immediately and start an export business. Ultimately iron and steel manufacturing may be attempted. It is admitted that considerable foreign capital is interested, and it is understood that German steel interests are concerned, including the Stinnes company.

1923 Pig Iron Output a Record

Total of 40,361,146 Gross Tons Exceeds 1916 Record of 39,434,797 Tons by 926,349 Tons, According to Figures of American Iron and Steel Institute —Gain Over 1922 Was 13,141,242 Tons

PRODUCTION of pig iron in the United States during 1923 was 40,361,146 gross tons and established a new high record, according to official figures just announced by the American Iron and Steel institute. As compared with the previous high point of 39,434,747 tons in 1916, the 1923 output represented a gain of 926,349 tons. The output of 1922 was 27,219,904 tons, the 1923 production being an increase of 13,141,242 tons, or 48.28 per cent and the largest gain in tonnage of any year on record. In percentage, however, this was exceeded by the gain of 1922 over the extreme depression year of 1921 which was 63.2 per cent. During the first half of 1923, production totaled 21,016,475 tons, and, during the second half, 19,344,671 tons, the second half output being 1,671,804 tons less than the first half. Making up the 1923 output was 19,795,590 tons of basic, 11,677,509 tons of bessemer; 6,470,013 tons of foundry, 1,571,064 tons of malleable, 327,430 tons of forge and 519,540 tons of all other. On a percentage basis over 1922, basic gained 43 per cent, bessemer 49.4 per cent, foundry 62.7 per cent and malleable 49.4 per cent.

According to the institute, 29,838,680 tons of the 1923 output was made for the maker's own use while 10,522,466 tons was made for sale. This represented a proportion of 74 per cent nonmerchant and 26 per cent merchant. Corresponding figures during 1922 were 76.2 per cent nonmerchant and 23.8 per cent merchant. The figures for 1921 were 77.7 per cent and 22.3 per cent, respectively.

On the basis of fuel used in production, 40,097,239 tons of the 1923 output was made with coke and included pig iron and ferroalloys made with electricity, electricity and coke, etc.; 12,730 tons was made with anthracite, and included pig iron made with mixed anthracite and coke; and 251,177 tons was made with charcoal. Coke iron production represented 99.4 per cent of the total. The corresponding ratios for 1922 and 1921 were 99.2 and 99.4 per cents, respectively.

Charcoal iron with 251,177 tons in 1923 was an increase of 26,446 tons over the 224,731 tons of 1922. As was the case during 1922 only the hot and warm blast method was used. Production of ferromanganese and spiegeleisen totaled 376,717 tons, of which 247,031 tons was ferromanganese and 129,686 tons was spiegeleisen. In 1922, ferromanganese aggregated 150,115 tons and spiegeleisen 73,443 tons, the total being 223,558 tons.

On June 30, blast furnaces active totaled 335 while on Dec. 31, 239 out of the total of 432 were operating. At the close of the year 55.4 per cent of the furnaces of the country were in blast. At the end of 1922, 263 out of 449 were active representing 58.5 per cent.

PRODUCTION OF COLD AND HOT AND WARM BLAST CHARCOAL PIG IRON, 1919–1923

Kinds of iron.	1919.	1920.	1921.	1922.	1923.
Cold blast	2,113	1,734	350	.....	.....
Hot and warm blast	324,984	321,662	94,380	224,731	251,177
Total.....Gross tons.	327,097	323,396	94,730	224,731	251,177

TOTAL PRODUCTION OF PIG IRON ACCORDING TO FUEL USED

States.	Blast furnaces.*				Production—Gross tons. (Includes spiegeleisen, ferro-mang., ferro-silicon, ferro-phosphorus, etc.)		
	In blast June 30, 1923.	Dec. 31, 1923.			First half of 1923.	Second half of 1923.	Total 1923.
		In.	Out.	Total.			
Coke*	322	230	176	406	20,874,240	19,222,999	40,097,239
Anthracite†	1	0	2	2	8,766	3,964	12,730
Charcoal	12	9	15	24	133,469	117,708	251,177
Total	335	239	193	432	21,016,475	19,344,671	40,361,146

* Includes pig iron and ferro-alloys made with electricity, electricity and coke, etc.
† Includes mixed anthracite and coke pig iron.

PIG IRON MADE FOR SALE OR FOR USE OF MAKERS IN 1923

Grades.	For sale.	For maker's use.	Total. Gross tons.
Basic	2,008,442	17,787,148	19,795,590
Bessemer and low-phosphorus	868,277	10,809,232	11,677,509
Foundry, including ferro-silicon	5,778,931	691,082	6,470,013
Malleable	1,469,673	101,391	1,571,064
Forge or mill	186,592	140,838	327,430
Ferro-manganese	86,568	160,463	247,031
Spiegeleisen	72,494	57,192	129,686
All other grades	51,489	91,334	142,823
Total.....Gross tons.	10,522,466	29,838,680	40,361,146

PRODUCTION OF PIG IRON BY GRADES, 1908–1923

Years	Basic.	Bessemer.	Foundry.	Malleable.	Forge.	All other.	Total. Gross tons.
1908.	4,010,144	7,216,976	3,637,622	414,957	457,164	199,155	15,936,018
1909.	8,250,225	10,557,370	5,322,415	658,048	725,624	281,789	25,795,471
1910.	9,084,608	11,245,642	5,260,447	843,123	564,157	305,590	27,303,567
1911.	8,520,020	9,409,303	4,468,940	612,533	408,841	229,910	23,649,547
1912.	11,417,886	11,664,015	5,073,873	825,643	469,183	276,337	29,726,937
1913.	12,536,693	11,590,113	5,220,343	993,736	324,407	300,860	30,966,152
1914.	9,670,687	7,859,127	4,533,254	671,771	361,651	235,754	23,332,244
1915.	13,093,214	10,523,306	4,843,899	829,921	316,214	309,659	29,916,213
1916.	17,684,087	14,422,457	5,553,644	921,486	348,344	504,779	39,434,797
1917.	17,671,662	13,714,732	5,328,258	1,015,579	345,707	545,278	38,621,216
1918.	18,646,174	13,024,966	5,145,260	1,117,914	393,932	726,398	39,054,644
1919.	14,494,131	9,975,934	4,916,758	1,009,049	271,286	348,206	31,015,364
1920.	16,737,722	12,062,084	5,957,782	1,310,951	318,048	539,400	36,925,987
1921.	7,753,071	5,595,215	2,568,136	457,340	112,748	201,616	16,688,126
1922.	13,841,367	7,813,203	3,976,431	1,051,495	214,210	323,198	27,219,904
1923.	19,795,590	11,677,569	6,470,013	1,571,064	327,430	519,540	40,361,146

IRON TRADE REVIEW

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Is Caution a Permanent Factor?

ONE of the most striking characteristics of domestic business in recent months has been the spread and persistence of buyers' conservatism. Even the upward sweep of activities in numerous basic lines since the beginning of the year has failed to shake off the marked restraint in future ordering. So uniform has the practice of this policy become that the question may well be raised whether or not a fundamental change in buying and selling has taken place.

The generation before the war was a period of rising prices. The war and postwar years ushered in an era of violent dislocations of supply and demand and prodigious price and credit inflation. These conditions were conducive to forward buying. This normal and healthy custom in the prewar markets turned into a speculative folly in the postwar boom of 1920.

The disastrous results of the plunge of purchasing in 1920 left its deep imprint upon business men. This fact was first tangibly revealed early in 1923 when caution began to spread and checked the incipient boom. But there seems to be other and deeper reasons for the restricted buying than the mere memory of 1920. These lie at the very tap roots of the economic situation. They are concerned with such controlling forces as production, distribution and price trends.

The war brought about a large expansion of plant capacity. Moreover, many of the abnormal conditions which hampered and impeded industrial operations in recent years have been smoothed away. The astounding increase in railroad efficiency in itself has been an important contribution to the restoration of more stabilized conditions. Underlying deficiencies in industry have been overcome.

Ample supplies and free movements of goods have increased the competition of sellers. One result has been to steady commodity prices. In the coming months and years price fluctuations should tend to be less sweeping with the probable long-time trend gently downward. Actually prices have been receding this year despite the vast credit resources of this country. These conditions give no incentive to speculative future buying. As a result wholesalers and retailers of merchandise as well as the users of steel are buying only for immediate needs.

Such a policy implies discretion and a close study of conditions. It is working a hardship on some branches of industry where plans must be laid well ahead. In steel and various other industries, orders are astonishingly small relative to the present rates of activities. Measured by the bookings of the United States Steel Corp. forward orders are only 18 per cent above the low level of the 1921 depression. Reduced bookings tend to restrain the enthusiasm of producers and to hold prices in check. This explains the parodox of price softness in the present expansive steel market.

While basic economic conditions remain as they are, heavy forward buying is unlikely. That is not inconsistent, however, with large scale consumption and prosperous activities. Meanwhile small future purchasing should help keep producers on the alert and out of the deep water of overproduction.

Small Exports Hurt Copper

RECENT decision of some of the higher cost American copper producers to curtail their output by a 5-day week has been construed a bull rather than a bear argument. As a matter of fact, February copper deliveries into American consumers' hands were almost a record. However, export shipments have not been up to expectations nor sufficient to take up entirely the margin between the large American consumption and the heavy North and South American and African production. In consequence, for nearly a year copper has been in a buyers' market with prices about 4 cents under the 20-year average and fully 10 cents below the level at which it would be selling if it occupied its prewar relationship to other commodities. Excess production has been slight, about 6000 tons for the whole of 1923, but sufficient to exert a psychological influence on both buyers and sellers. The present plans presage a cut of 7500 tons to 10,000 tons a month.

This curtailment takes on additional market significance in view of the fact that the Dawes committee soon is to make its report to the reparations commission, which may open the way to a settlement of the reparations muddle. Inasmuch as copper exports took

over 50 per cent of American refinery output before the war, while in 1923 exports took only 36 per cent of the output, any improvement in the European economic position means much to copper.

Automobile Expands Aluminum Use

AS IN many other fields where the automobile has furnished a large market for material, taking major tonnages of steel, large areas of leather, much plate glass and rubber, aluminum is indebted to the automotive industry for sufficient added demand to place it among the important producing departments of this country.

From a precious metal a few years ago, a curiosity of which paperweights were made, aluminum has become a commercial metal, relatively high in price, yet available for such large construction as automobile tops, giving strength and rigidity with lightness. Smaller parts of automobiles are preferably made of this metal, due to its lightness, ready adaptation to forming operations and its lack of corrosion. Taking the total use of aluminum in automotive construction it is estimated 25 per cent of the domestic production is absorbed in this way, in addition to such scrap and imported metal as may find its use in the same direction. The consumption of 1922 by automobile makers was 72,700,000 pounds or 36,350 tons.

Stimulation of demand in this large way reacts to cause enlarged production and better methods of refining, all of which tends toward decreased cost and a better product. Alloying, to obtain further qualities for other uses, is being undertaken.

Fortunately in this as in most metals, the United States is well supplied with the raw material and tonnage of the metal depends only on demand and the ability of existing refining plants to convert it.

Pig Iron Still at Peak

NO YEAR in history showed such a gross gain in pig iron production as 1923. This is the fact that stands out most strongly in the official statistics of pig iron production for 1923 which now have been announced. The gain in output of 1923 over 1922 reached the astounding figure of 13,242,000 tons or 48.3 per cent. This exceeds the expansion of 1922 production over 1921, another period of unusually large change when the gain was 10,531,878 tons.

Total production of pig iron in 1923 was the greatest on record and reached 40,361,146 tons. This exceeds by 926,349 tons the previous high mark of 39,434,797 tons in 1916. Basic, foundry and malleable grades attained new tonnage peaks but bessemer, charcoal and forge, as was to be expected, were considerably down from the figures for a number of previous years. The increase in malleable iron probably was the most conspicuous for in 1923 the output of this grade of 1,571,064 tons was 260,013 tons, or 20 per cent higher than the former top point in 1920. This clearly reflects the substantial growth of the malleable castings industry in recent years.

So far in 1924, pig iron production, while on a large scale, has been behind that for the corresponding period in 1923. As has been pointed out, steel production is close to the high record level at this time but pig iron has been lagging and in February was at only 85 per cent of the maximum rate in history last May. The way the year has started out, taken in connection with other circumstances, including the large total of stocks still on merchant furnace yards, discourages the probability of any new record of pig iron production being attained in 1924. Taken as a whole, however, the past 14 months probably have shown the greatest sustained production of pig iron in history.

Steel Producers as Manufacturers

ASIDE from its appeal as a description of a most interesting process of preparing sheet metal for certain uses, the article on lithographing sheets and tinplate which appears elsewhere in this issue is significant because it suggests a noteworthy phase in the development of the iron and steel industry. It is not difficult to see in the recently built, elaborate lithographing plant a reflection of the same motive that has induced other steel producers to pursue their manufacturing operations several steps beyond the limits of steelmaking and rolling.

This practice has been in effect for many years in some branches of the steel industry. Many wire makers follow their products through to the finished article and in addition to being producers of steel wire actually are manufacturers of nails, fencing, screens, springs, staples, horseshoes, etc. One steelmaker, in addition to its iron and steel making operations builds ships, cars, engines, machine tools, turn-tables, air compressors, smelting furnaces, etc., and also manufactures such articles as automobile brake drums, boiler heads, car wheels, hoist hooks, frogs, switches, gears, pinions, tie plates, and hundreds of other finished articles. Another company builds electric furnaces and many producers extend their operations on bars and rods down to the manufacture of bolts, nuts, rivets, etc., the products being boxed for retail consumption.

If space permitted, a sufficient number of examples could be cited to show that the so called iron and steel industry embraces a greater range of activities than is implied by its name. The great majority of companies loosely designated as iron or steel producers not only make steel but consume important tonnages of it in turning out manufactured articles.

This being true, it is interesting to contemplate the probable direction of future development. Will sheetmakers continue to draw the line at tinning, galvanizing and lithographing or will they go a step farther in the fabrication of the articles in which sheets used?

Current Statistics of Industry

By-Product Coke Total in February Less

Washington, March 17.—Unlike the production of iron and steel, which increased somewhat, the production of by-product coke declined 3.6 per cent in February, says the geological survey.

The production of beehive coke continued to increase slowly in February, and the total output is now estimated at 1,211,000 net tons. The February, 1924, output was 270,000 tons, or 18 per cent less than in the same month a year ago, and excepting only February, 1921 and 1922, is the lowest figure on record for such month. The following table shows the monthly record of production in net tons:

	By-product coke	Beehive coke	Total
1917 monthly ave.	1,870,000	2,764,000	4,634,000
1918 monthly ave.	2,166,000	2,540,000	4,706,000
1919 monthly ave.	2,095,000	1,638,000	3,733,000
1920 monthly ave.	2,565,000	1,748,000	4,313,000
1921 monthly ave.	1,646,000	462,000	2,108,000
1922 monthly ave.	2,379,000	714,000	3,093,000
1923 monthly ave.	3,127,000	1,497,000	4,624,000
December, 1923...	2,999,000	1,063,000	4,062,000
January, 1924....	3,094,000	1,154,000	4,248,000
February, 1924....	2,981,000	1,211,000	4,192,000

(a) Excludes screenings and breeze.

The production of beehive coke continued to improve in the first week of March, and the total output is estimated at 326,000 net tons. The present weekly rate of production is 11 per cent less than a year ago. The weekly output by districts follows:

	Week ended Mar.8, 1924(a)	Mar.11, 1924(b)	Mar.10, 1923
Pennsylvania and Ohio	269,000	255,000	288,000
West Virginia	18,000	17,000	22,000
Alabama, Kentucky Tennessee and Georgia	20,000	28,000	25,000
Virginia	10,000	10,000	18,000
Colorado and New Mexico	5,000	5,000	8,000
Washington and Utah.	4,000	4,000	5,000
United States total....	326,000	319,000	366,000
Daily average.....	54,000	53,000	61,000

(a) Subject to revision. (b) Revised from last report.

A sharp decline has occurred in the production of bituminous coal. In the week ended March 8 the decline was 10 per cent to a total of 9,596,000 tons.

Steel Traffic Heavier

Pittsburgh, March 18.—Most of the 2,073,998 tons transported over the three rivers in the Pittsburgh territory in February was coal which totaled 1,866,973 tons. The tonnage for the month represents a gain of 167,327 tons over the 1,906,671 tons carried in January. Steel products carried over the Monongahela river in February totaled 27,005 tons, compared with 15,700 tons in January, while 23,668 tons were carried over the Ohio river in February, as against 11,050 tons in January. The February total steel product tonnage transported was 50,673 tons, or more than twice as much as that shipped in January.

Shipments of steel products in 1923 by months, as well as in the first two months of this year, are as follows:

	Allegheny river	Monongahela river	Ohio river	Total
February	....	27,005	23,668	50,673
January, 1924	....	15,700	11,050	26,750
December ..	485	13,460	35,420	49,365
November ..	304	11,980	12,450	24,734
October	....	20,425	9,755	30,180
September ..	....	18,256	11,390	29,646
August	....	34,590	20,922	55,512
July	100	36,827	16,335	53,262
June	75	44,791	21,558	66,424
May	....	25,910	21,200	47,110
April	100	21,825	20,800	42,725
March	....	17,291	16,191	33,482
February ...	....	19,337	3,285	22,622
January, 1923	....	26,997	1,030	28,027

Revolute Wire Co., Hastings-on-Hudson, N. Y., has increased its capital stock from $100,000 to $250,000.

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Cast Iron Pipe Bookings Recover in January

Washington, March 18.—Bookings of cast iron pipe in January recovered sharply from the last few months, the total of 202,768 tons being the largest since June, 1923, when orders amounted to 217,176 tons, according to reports of the department of commerce. Production also increased, January's total being 81,431 tons as compared with 63,171 tons in December and 80,945 tons in November. The following comparative figures include returns from 12 establishments, with the exception of January when but 11 companies reported, and are confined to bell and spigot pressure pipe.

	Produced tons	Shipped tons	Orders from stock tons	Orders from specifications tons
June	81,208	88,318	17,905	199,271
July	79,528	77,828	16,839	183,130
August	84,588	84,843	14,727	165,518
September .	77,186	78,101	14,215	156,585
October ...	88,696	88,000	17,431	119,947
November ..	80,945	73,080	18,238	118,995
December ..	63,714	59,434	16,917	168,383
Totals for Seven mo.	555,865	549,604	116,272	1,111,829
Mo. av., June to December ..	77,981	78,512	16,610	158,833
Jan., 1924	81,431	63,987	30,827	171,941

Steel Castings Bookings Show Large Increase

Washington, March 18.—Bookings of steel castings in February, totaling 70,829 tons, were the largest of any month since June 1923, when sales amounted to 84,878 tons, according to reports of the department of commerce. The manufacturers of steel castings operated at 73.1 per cent of capacity in February as compared with 50.6 per cent in January and 42.3 per cent in December.

1923	Total net tons	Per cent capacity	Railway specialties net tons	Miscellaneous net tons
Jan.	100,605	103.8	47,879	52,726
Feb.	90,152	93.0	39,845	50,307
Mar.	143,564	148.2	76,409	67,155
April	90,968	93.9	39,610	51,358
May	89,493	92.4	38,788	50,705
June	84,878	87.6	42,773	42,105
July*	52,066	53.7	16,741	35,325
Aug.	**50,463	52.1	18,332	**32,131
Sept.	**47,476	49.1	21,685	**25,791
Oct.	**37,312	38.6	9,840	**27,472
Nov.	**39,572	40.9	12,916	**26,656
Dec.	**41,014	42.4	15,182	**25,832
1923 totals	867,563	...	380,000	487,563
Mo. av...	72,335	74.6	31,667	40,668
1924				
Jan.	49,164	50.7	18,970	30,194
Feb.	70,829	73.1	34,901	35,928

*Two companies with a capacity of 785 tons per month on miscellaneous castings now out of business.

**Revised.

The Business Trend

March 20, 1924

BY JOHN W. HILL, FINANCIAL EDITOR

IRREGULARITIES continue to abound in the economic situation. Yet constructive events have loomed overshadowingly recently. At home numerous basic industries are exceptionally active. Abroad, the franc has had a dramatic recovery.

Within a week the franc advanced 40 per cent It cancelled nearly all of its amazing losses since the first of the year. Probably no foreign exchange has ever rebounded with such force.

The francs' decline was due to an unbalanced French budget and a rate of expenditure far in excess of income. This was justified by the government by charging the deficit to German reparations. These have not been forthcoming in expected amounts. Neither has the Ruhr occupation been financially successful.

France had two courses open. One was to print paper money and plunge into an era of inflation. The other was to affect rigid economies and balance its budget. One path would lead to bankruptcy; the other to solvency.

Values Crumble

Pending a decision bear speculation and the flight of frightened capital from France brought a crumbling of currency values.

One more thing is needed to save France from the fatal course of many other European nations. That is a reparations settlement and consequent economic stability in Europe. Temporarily J. P. Morgan & Co. have jumped into the breach with a loan of $100,000,000. This gave the franc's recovery its first impetus.

But the loan could not stem the tide of depreciation permanently. The situation must be fundamentally mended. Therein lies the world hope in rise of the franc. It is understood that France has assured the loaning bankers that she not only will check inflation and economize but that she will accept the Dawes reparations report.

Report Nearly Ready

This report is nearly completed. It is based on common sense business principles. It will call for high taxation for Germany and maximum reparations payments according to her ability. In order to accomplish this it is recognized the German industrial machine must be allowed to function without interference.

Settlement of the perplexing reparations problem seems now in sight. World trade will profit from the profound stimulus of such an event. Meanwhile American industries, with a few exceptions, are active. Outputs of steel ingots, and automobiles are climbing to new high records.

Consumption is enormous also, as indicated by the record-breaking winter volume of car loadings.

The Barometer of Business

Weekly Comparison

	Last week	Week before	One mo. ago	One year ago	1913
Business failures..	425	364	363	378	...
Cash ratio Fed. Res. System, %	80.3	80.5	80.9	75.4	...
Loan rate, 4-6 mo. N. Y. %	4½-4¾	4½-4¾	4¾-5	4¾-5	5½-6
Aver. 25 industrial shares	$111.41	$111.68	$111.32	$116.03	$58.19
Aver. 25 railroad shares	$61.25	$86.28	$60.14	$65.06	$82.90
Aver. 40 bonds	$77.84	$77.65	$77.91	$78.42	$93.00
Car loadings, week ended March 1.	945,019	845,898	929,936	918,594	*811,105
Bank debits, 246 cities (000 omitted)	$9,034,234	$10,930,887	$8,521,255	$9,379,380	.....

*1920

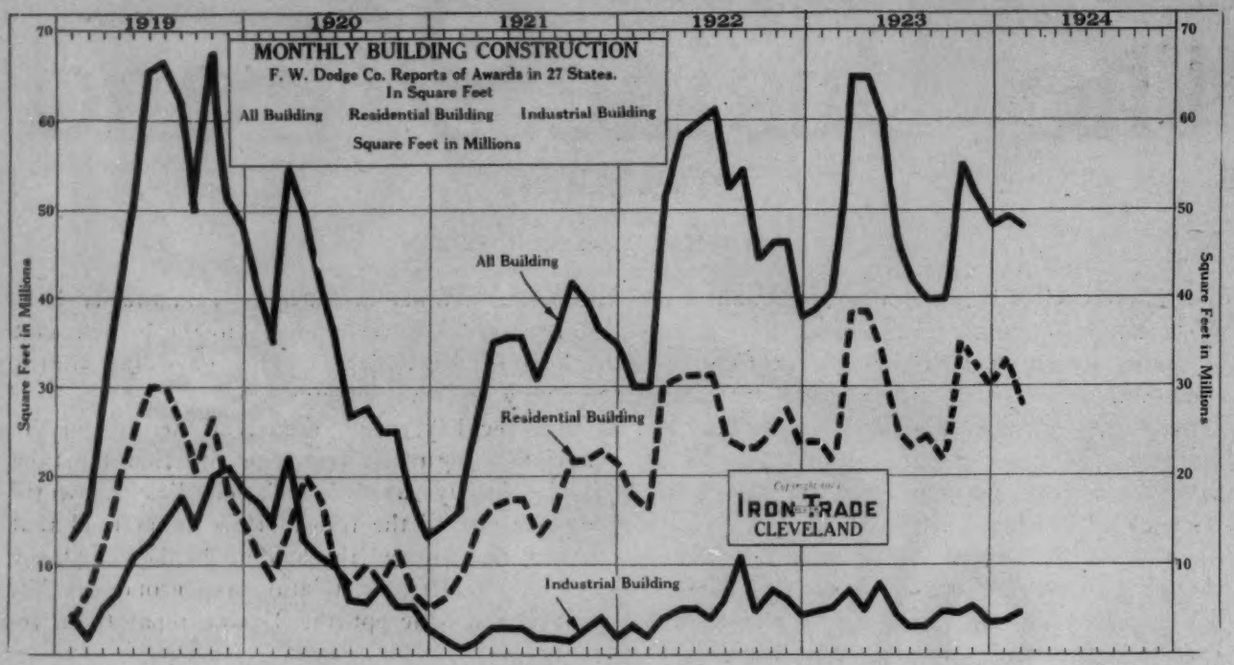
Foreign Exchange (Demand)

	Normal	Last week close	One week before	One month ago	One year ago
Sterling	$4.86	$4.28	$4.25	$4.29	$4.69
Francs	19.3c	4.73c	3.42c	4.37c	6.33c
Lira	19.3c	4.26c	4.13c	4.33c	4.81c

Monthly Comparison

	February	Month before	Year ago	Mo. average 1913
Dodge Building awards in 27 states (sq. ft.)	48,036,100	48,867,000	41,751,500	31,250,000
Business failures: Number	1780	2108	1508	1336
Liabilities	$35,942,037	$51,272,508	$40,627,939	$22,732,000
Exports	$367,000,000	$395,170,129	$306,957,000	$233,195,000
Excess of gold imports	$34,606,134	$44,993,832	$6,983,000	†$630,716
Bureau of labor price index	$151	151	150	100
Bradstreet's price index	139.4	142.7	149.6	100
Economist's British price index	171.8	171.5	162.0	100
Nat'l Industrial Con. board living cost index	$164.6	165	161.4	‡100
New incorporations	$661,048,200	$878,704,700	$700,708,300	$172,131,000
Railroad net earnings	§$51,281,000	$72,000,000	$61,128,970	$59,301,000

†Excess of gold exports. ‡July, 1914. §January.

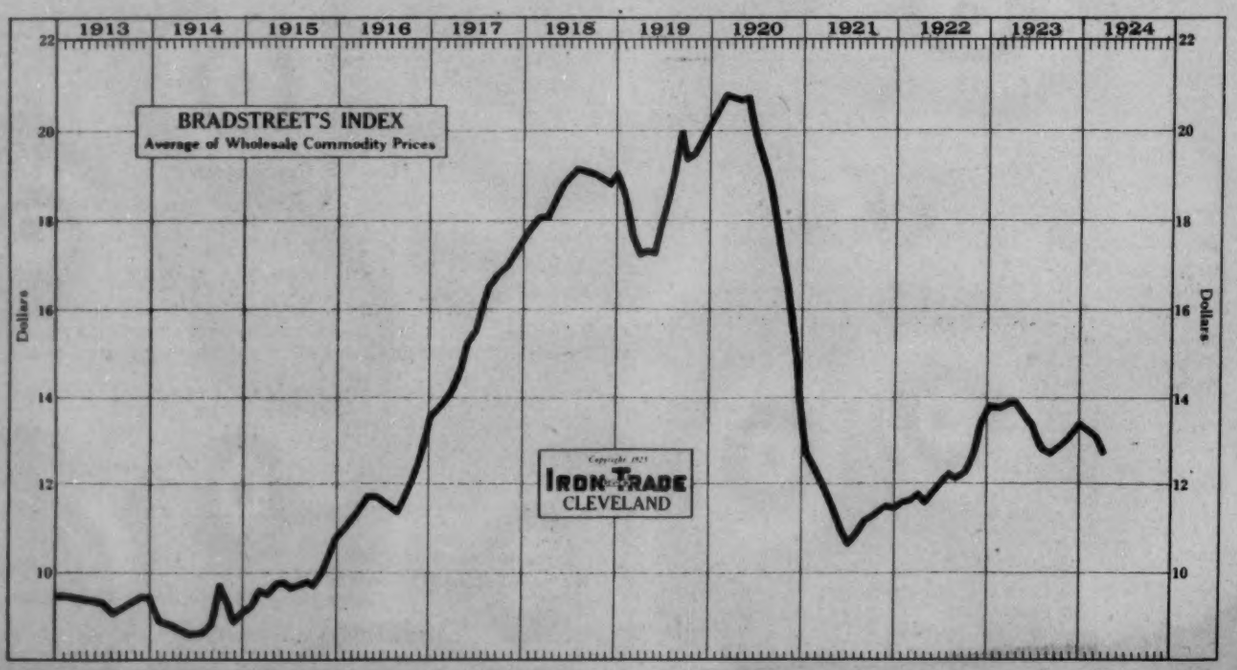


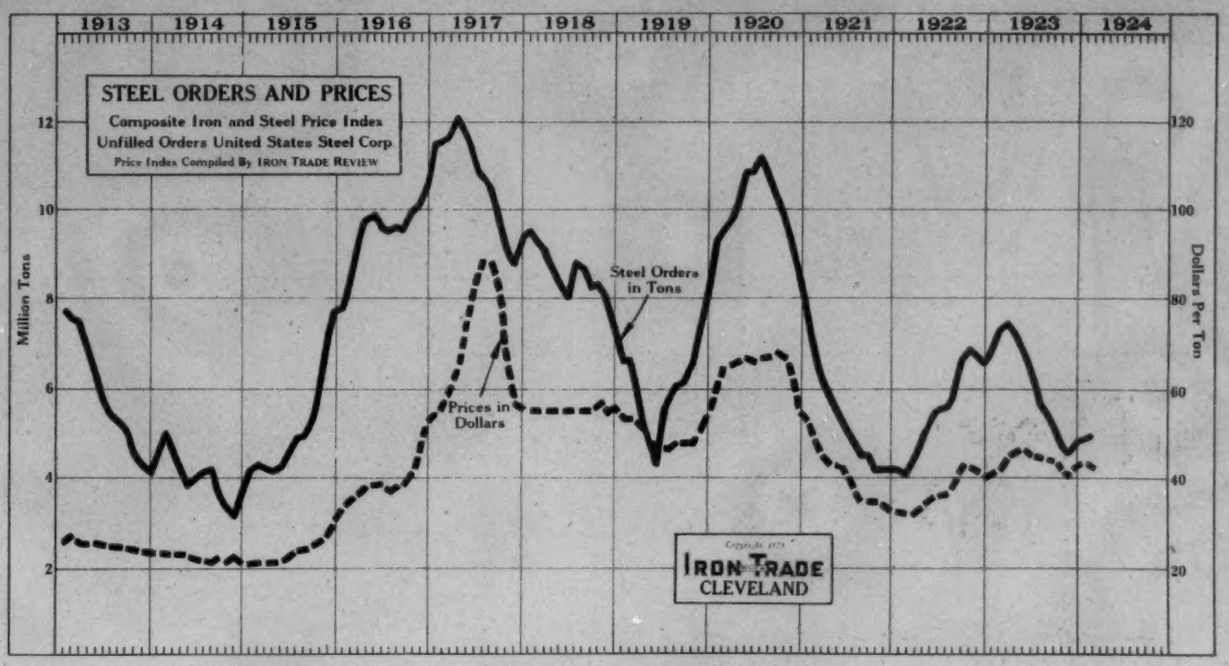
Building Construction

FEBRUARY construction awards for all previous years were broken last month. The aggregate of awards in 27 northeastern states amounted to 48,036,300 square feet. This was slightly below the January level but 15 per cent over the former high February mark of 1923. Much of the gain over 1923 came from speculative housing activities in a few eastern centers. Residential work fell off elsewhere and that class of building for the country declined sharply. This reflects rising costs and fewer shortages. Industrial building gained.

Bradstreet's Prices

THE drift of wholesale commodity prices has been slightly downward for three months past. This is in sharp contrast with the rising tendency of 12 months ago. Ample supplies of goods coupled with buyers' restraint have held prices in check, counteracting the inflationary influences of superabundant credit resources. Heavy consumption of goods prevents great general weakness, however. *Bradstreet's* index shows a drop of 4 per cent since Dec. 1. It is 7.4 per cent under March 1, 1923, and 38 per cent under 1920.



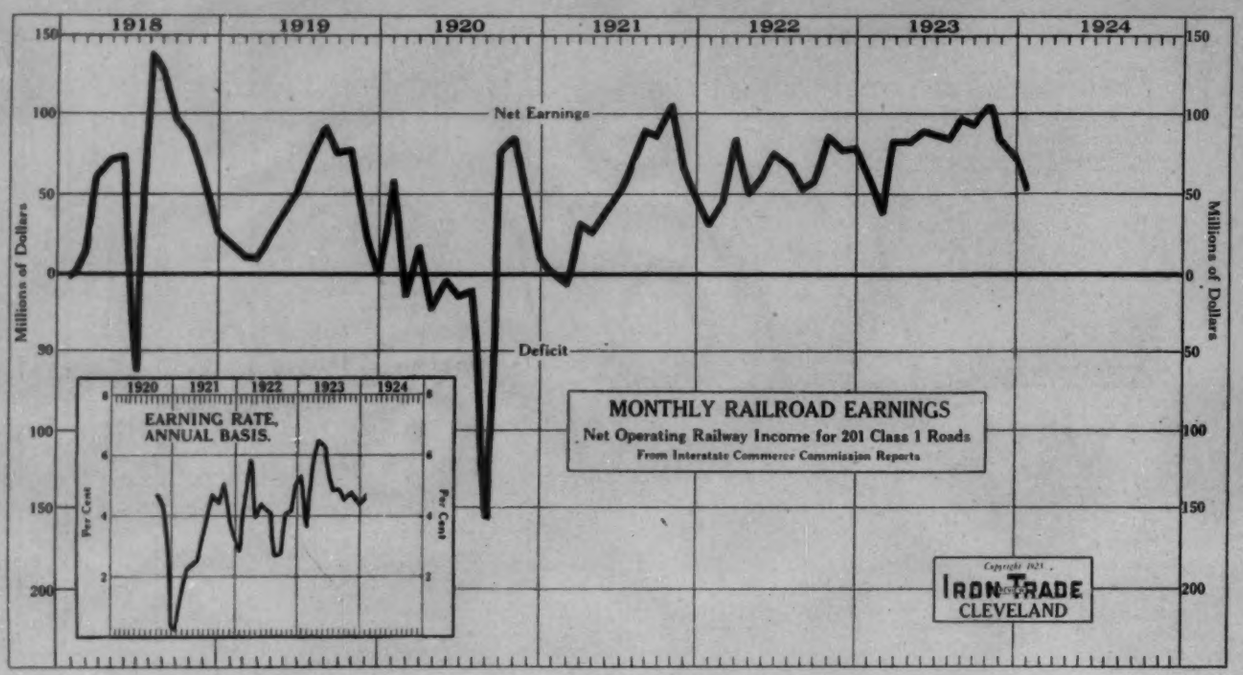


Steel Orders and Prices

ONE of the most striking characteristics of the present situation is the meagerness of forward bookings in many industries relative to the high rate of activities. This is particularly true of iron and steel. On March 1 unfilled orders of the United States Steel Corp. were only 18 per cent above the low level for the 1921 depression. They are a third less than one year before and only 55 per cent of the 1920 top. Hand-to-mouth buying with heavy current consumption explain the situation. Prices are slightly softer.

Ingot Output

THE steel industry is climbing swiftly and with apparent certainty toward the goal of new high records of output. It attained, in February, an average daily rate of ingot production of 151,227 tons. That has been exceeded only in two previous months in the history of the industry—in April and May of 1923. The February rate was within 4 per cent of the peak for all time in April of last year. The rebound from the 1923 low point in December was 33 per cent. This recovery was phenomenally rapid.

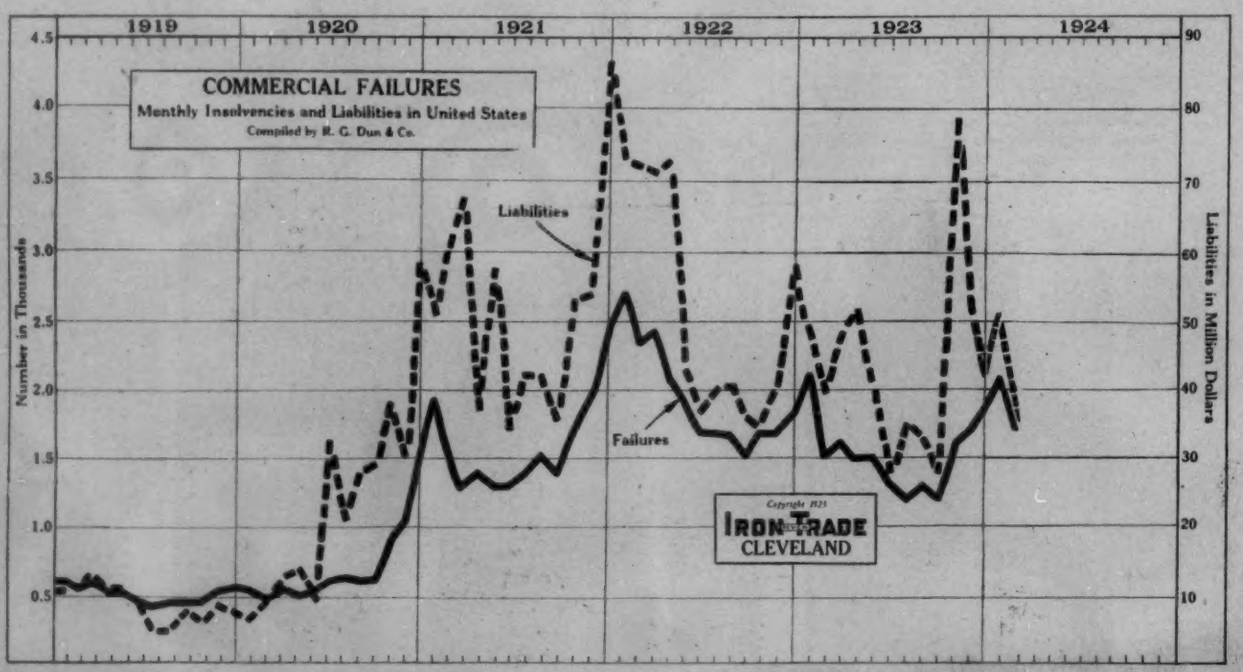


Railroad Earnings

CLASS 1 railroads throughout the United States earned at the annual rate of 4.54 per cent on their tentative valuation for January. In dollars the earnings totaled $51,281,-200. This showing compared with $61,128,-000 and an annual rate of 5.58 per cent in January 1923. During the first part of the month freight movements were much under the records for one year ago. Since the middle of the month the 1923 records have been passed. This indicates a better earning exhibit for succeeding months.

Commercial Failures

A SEASONAL decline in commercial failures occurred in February. During the month there were 18 per cent fewer defaults and 30 per cent smaller liabilities for all failed companies, than one month before. In February 1923 insolvencies fell off 29 per cent from the preceding January, but liabilities declined only 17 per cent. Compared with February 1923 the number of failures in February this year of 1730 gained 222. Liabilities of $35,-942,000 show a substantial reduction from the total for February 1923.



Lithographing 72,000 Sheets Daily

BY JOHN D. KNOX

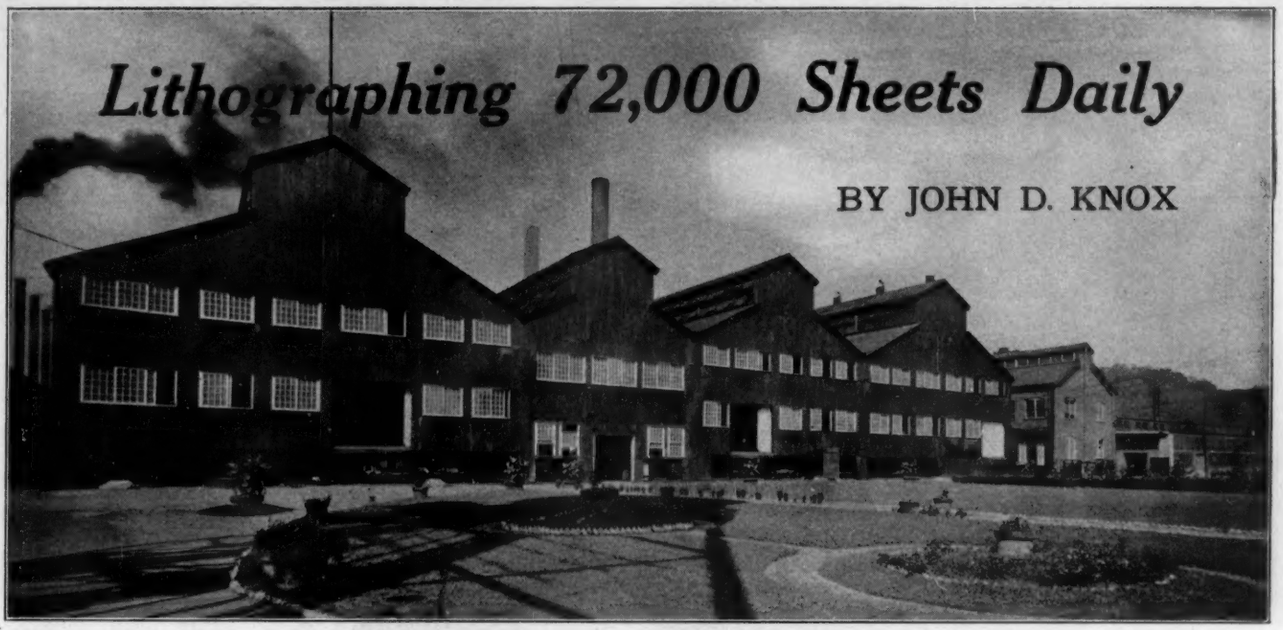


Fig. 1—Entrance to the Wheeling Steel Corp., Yorkville, O., division which includes 24 black plate mills and 39 tinning sets

LITHOGRAPHY, the art of making a design on stone so that ink impressions can be taken from it, dates back to the early part of the eighteenth century, although only within the last few years has the art been linked up with the steel industry in this country. The average layman gives little thought to the method of producing printed copies of writing or drawing on steel but with the growing number of decorated commodities encountered in everyday life, such as tobacco cans, shoe polish boxes, buttons, badges, and containers too numerous to mention, a description of the process of lithographing, especially as it applies to the decorating of tin plate, invites interest.

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Lithographed stock cannot be duplicated without considerable expense and hence the advantages to be gained by decorating metal by this process are obvious. A paper label is costly to apply and is attractive to rodents because of the adhesive compound used. In addition, a paper label when subjected to dampness will pucker or loosen and if soiled cannot be cleaned satisfactorily. Shop-worn articles cannot be relabeled to advantage nor can a certain brand of goods be counterfeited by unscrupulous merchants when the containers are lithographed. Foreign packers have recognized this particular advantage for many years. Of equal importance is the fact that containers fabricated from lithographed metal can be produced cheaper in many cases than containers made of other material and labeled with paper. As an illustration, many cigar makers now are using lithographed tin boxes for packing their

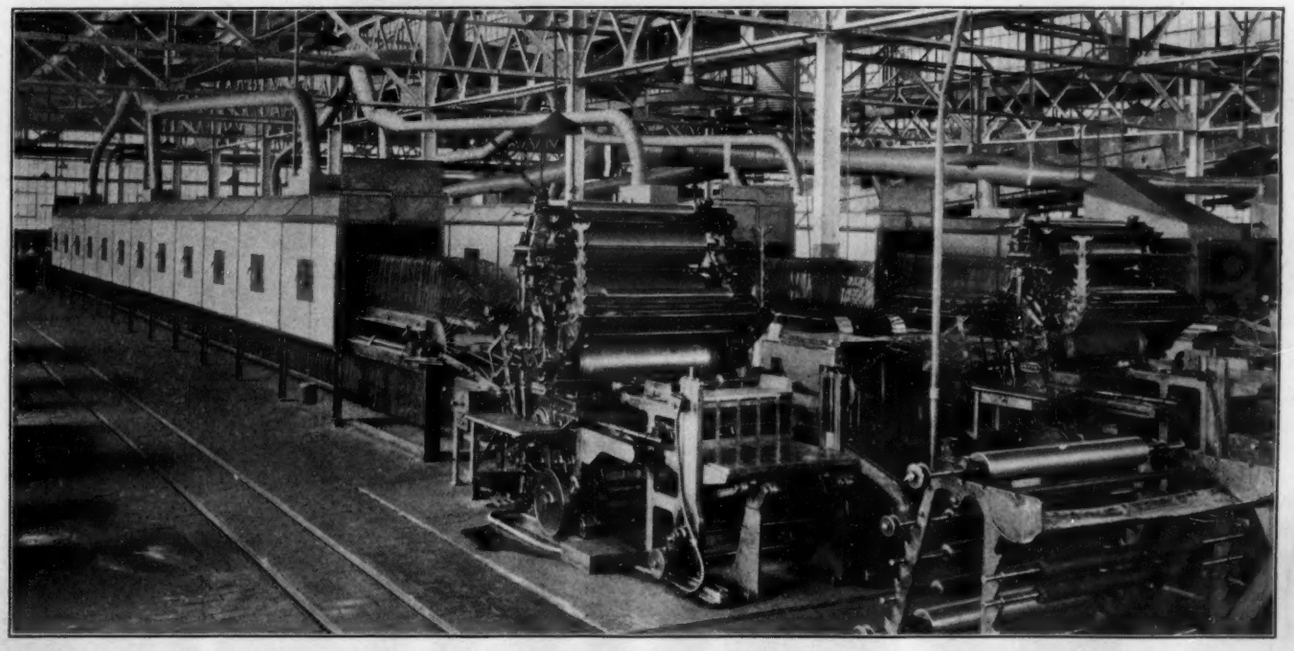


FIG. 2—EACH ROTARY DECORATING PRESS IS SERVED BY A CONTINUOUS-TYPE BAKING KILN. A SYSTEM OF TRACKAGE IS PROVIDED TO FACILITATE THE TRANSFER OF STOCK FROM THE REAR OF THE KILNS TO THE PRINTING PRESSES WHEN THE LITHOGRAPHING JOB INVOLVES TWO OR MORE COLORS

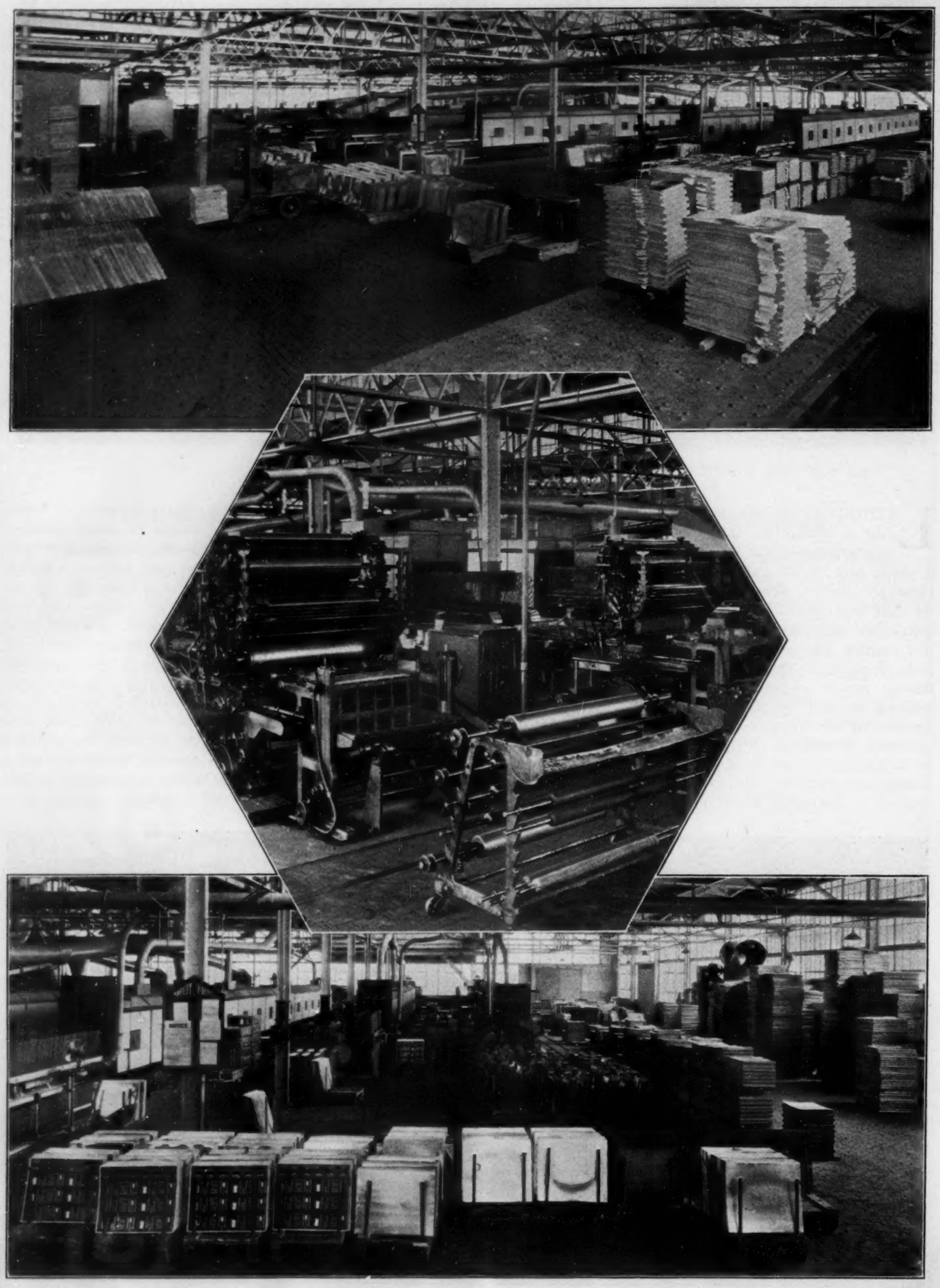


FIG. 3—GENERAL VIEW OF THE LITHOGRAPHING DEPARTMENT. STOCK FROM THE TIN MILLS IS DELIVERED UNBOXED TO THE DEPARTMENT. FIG. 4—FEEDING SIDE OF THE DECORATING PRESSES. EACH PRESS MAKES ABOUT 5000 IMPRESSIONS AN HOUR. FIG. 5—FINISHING END IN THE LITHOGRAPHING DEPARTMENT SHOWING THE DISCHARGE END OF THE BAKING KILNS AND DECORATED PLATE ON SKIDS READY FOR PACKING

product instead of cedar wood boxes to which their label, manufacturing permit, and internal revenue stamp must be affixed. The cost in this connection is not only less but the lithographed box serves as a humidor and is indestructible to the usual methods employed in handling. Other important uses of decorated metal are listed in the accompanying table.

Equipment Is Expensive

Metal decorating in the United States up until 1920 had been performed chiefly by fabricators whose plants were equipped with small lithographing units. The smallest unit that can be installed today would cost between $75,000 and $100,000 and if it is to be maintained on a low-cost basis, steady operation and a large volume of production is paramount; otherwise, the department would be rendered unbalanced when considering plant operations as a whole. Therefore, a fabricator finding himself in this position is obliged to operate his decorating department on a high-cost basis or to sell flat lithographed plates in the open market to reduce the overhead, which, beyond the proper charges for plant investment involves numerous high-salaried craftsmen including a lithograph superintendent, skilled pressmen, color grinders, transfermen, etc.

Of the iron and steel manufacturers in the United States, only one, the Wheeling Steel Corp., operates a lithographing department for decorating steel sheets and tin plate. The corporation owns approximately 5 miles of land fronting on the Ohio river at Yorkville, O., which lies about 10 miles north of Wheeling, W. Va. Its lithographing division is located on part of this site together with 24 hot mills for tin plate production. The lithographing department is housed in a monitor type structure which stands a suitable distance away from the hot mill buildings to eliminate the possibility of fire spreading from one portion of the plant to the other. The building was designed and constructed to meet every requirement for a plant of this character and covers the area of a city block. Ample light is provided through innumerable panes of glass which are set in steel sash and form a large portion of the side and end walls. In designing the building, atmospheric conditions were considered carefully for the welfare of the employes with the result that all nauseating fumes driven off during the baking operation are exhausted completely from the interior. Orders executed by the corporation's lithographing department involve numerous printing and coating operations and the maximum capacity is approximately 72,000 sheets printed and 80,000 sheets coated and lacquered daily which, when figured upon the basis of a single decoration is equivalent to 50,000 base boxes for a month's run of 25 working days. The plant does not operate at night because of the uncertainty associated with color work when artificial light is employed. Since the lithographing plant was built 4 years ago, its capacity has been increased 50 per cent and further enlargement of its output now is being undertaken.

The principle involved in the art of lithography is contingent upon the mutual repulsion between water and oil or grease. Originally all designs to be lithographed were engraved on stone from which facsimiles were made on paper. This method is still employed. During the printing operation, the engraved surface is kept moistened with water. When an ink roller is passed over the surface of the stone the ink cleaves to the design but is repelled by the moistened surface. By placing a piece of paper on the stone and applying pressure, the sketch is imprinted on the sheet. The same principle applies to the decoration of metal but instead of the direct method of printing, the offset process is employed, as will be explained later.

Sometime during the period between 1796 and 1798 the lithographing process was invented in Munich, Bavaria, by Aloys Senefelder. Being too poor to pay for the printing of his writings he attempted to do his own printing from plates etched in relief by using slabs of stone instead of plates of copper. Not knowing the composition of the varnish employed for the etching surface, he made a crayon of tallow and wax. The story is told that while he was in the midst of his work, his mother wished him to jot down a list of clothes to be sent to the laundress. Using the crayon he inscribed the memorandum on a stone but when he was about to clean off the surface it occurred to him that the body of the stone could be eaten away by a weak solution of nitric acid leaving the writing in relief, thus permitting impressions to be made.

While stone for lithographic work, similar in quality to that discovered accidentally by Senefelder, is found in various parts of Europe and America, the best grade still is quarried in Bavaria and is exported to all countries where lithography is practised. The rock is close-grained, clayey limestone varying in color from light buff to a pearl gray, and possesses the quality of absorbing both water and grease. The stones are split or sawn into slabs about 3 or 4 inches thick and from 6 x 8 inches to 44 x 62 inches in area. In preparing them for use the surface intended for the design is ground with sand to a uniform face and then polished with fine pumice stone and emery powder.

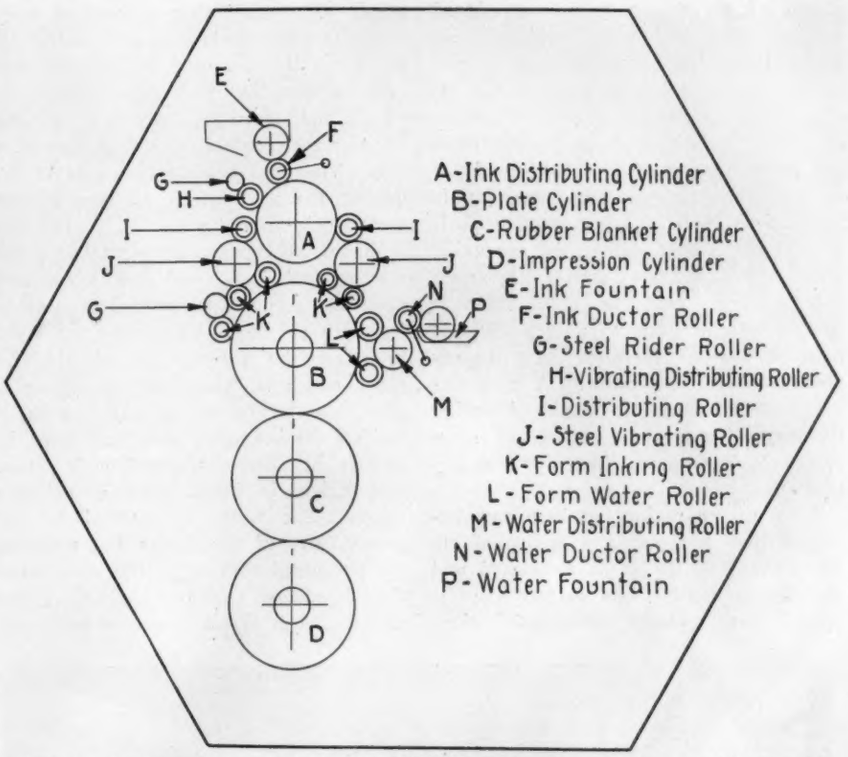


FIG. 6—ROLLER AND CYLINDER ARRANGEMENT OF THE ROTARY-TYPE DECORATING PRESS

Stone Coated With Gum

When the surface is smooth it is polished with a solution of gum arabic and then cleaned off with water. A

Partial List of Applications of Lithographed Metal

Ash trays
Auto accessory containers
Badges
Bale tags
Bottle caps
Bread boxes
Buttons
Candy boxes
Cigar boxes
Calendar edging
Cigaret boxes
Coffee cans
Crown caps
Curtain rods
Dials
Dry battery cases
Food containers
Games of all kinds
Grease cans
Grinding compound containers
Jar caps
Kitchen articles
Lard pails
Match holders
Metal furniture
Metal signs
Oil cans
Paint containers
Pen trays
Radio accessories
Shoe polish boxes
Soap boxes
Spark plug boxes
Spice cans
Tobacco cans
Tool boxes
Toys
Trunk iron

thin coating of the gum is retained by the pores which makes the surface of the stone repugnant to grease. After a sketch of the design to be reproduced is prepared in black and white by an artist, it is traced on the stone. In many cases, however, the design is drawn directly on the stone. By means of sharp pointed steel engraving tools the sketch is scratched in the thin layer of gum so that when an impression is pulled it will be in the negative position. Care is used during the engraving process to penetrate merely the gum coating, thus exposing only sufficient surface of the stone to absorb ink. It must be obvious, therefore, that the engraved design is shallow. A magnifying glass frequently is employed during the engraving process, which in some cases requires many days for completion.

After the engraving has been completed the lines are coated with linseed oil, the surface of the stone moistened and the design inked. The surface then is treated with a weak solution of nitric or hydrochloric acid which attacks the uninked portion rendering it more porous and leaving the inked design in slight relief. The stone then is washed with water and recoated with gum arabic to repell the lithographing ink and to prevent its spreading under the pressure to which the stone is subjected in the transferring process which is the next step. The gum coating also aids in retaining the acid which adheres to the greasy substance.

Numerous impressions are taken from the original design on the stone and these are mounted on a layout sheet to facilitate printing. The paper employed to effect the transfer usually is rice paper which is coated on one side with gum, starch and alum. The stone is laid on the bed of a press and after its surface has been dampened with water, the design is inked with a printer's roller. The water is repelled by the greasy lines of the design but moistens the uncovered surface of the stone while the ink adheres to the greasy lines of the design and is repelled by the wet stone.

FIG. 7—FOUR PRESSES ARE PROVIDED FOR TRANSFERRING DESIGNS FROM THE STONES TO THE PRINTING PLATES. A STICK-UP SHEET IS SHOWN ON THE TABLE OF THE PRESS IN THE FOREGROUND

A sheet of transfer paper then is laid on the design and the bed is pulled by a gear arrangement backward and then forward beneath a leather covered arm held rigidly in a vertical position and adjusted so as to exert the proper amount of pressure on the stone to secure a satisfactory impression.

Accuracy Is Required

When a sufficient number of duplicate copies of the design are made to fill the layout sheet the workman, known as the transferman, mounts them on a cardboard slightly larger than the tin plate to be decorated, arranging them the proper distance apart, which from center to center frequently involves a tolerance of 0.010 inch. This is known in lithographic parlance as the stick-up operation. If the lithographed tin plate is to be formed into some particular article, or is to be cut into multiples on which a single design is printed, the bending or cutting lines as the case may be are indicated by dots on the stick-up sheet, which, in turn, are impressed on the decorated plate during the printing process. Considerable skill, therefore, is entailed in arranging the duplicate designs on the stick-up sheet to secure an accurate margin and thus hold the shearing loss to a minimum.

The next step involved is to transfer the designs onto a zinc plate which on account of its flexibility can be curved to fit a cylinder of a rotary printing press. To permit a satisfactory transfer of the inked design and to lessen oxidation, the surface of the zinc sheet is given a finely-grained surface by securing the sheet to a tray and placing a quantity of grit, sand and small marbles on its surface. The tray is supported in a horizontal position. When power is applied the tray is given a circular motion which causes the marbles to roll over its surface and in about 25 minutes a suitable grain is produced. The plate is washed with water followed by the application of a weak solution of alum, nitric acid and water which imparts the property of absorbing greasy ink readily.

The layout sheet then is placed on the grained surface of the zinc plate and pressure being applied by a press similar to that used for transferring the design from the stone to the transfer paper, the ink design and paper adheres to the zinc sheet. The zinc plate then is placed in a tray and a spray of water is directed on its surface which causes the rice paper to pull away. It will be recalled that the transfer paper was coated on one side with a solution of gum, starch and alum and that the drawing was not transferred upon the surface of the paper but upon this gelatine-like film. Therefore, when the paper is washed from the zinc sheet the

film with its inked design is retained by the grained surface. The zinc plate then is coated with a solution composed of gum arabic and water to which a small quantity of phosphoric acid has been added so that the design will take ink and refuse moisture, and the remainder of the surface will take moisture and repel ink when subjected to the printing operation. All work entailed in transferring the design from the stones to the zinc printing plates is executed in a department closed off from the lithographing floor so that an even temperature can be maintained on the interior. Every conceivable appliance for the execution of this work is provided in this department.

Separate zinc printing plates are required to produce each color of a lithographed job, which in turn requires individual drawings to be made on stone. Frequently it is necessary to make separate plates to obtain various shades of the same color. Care, therefore, is exercised in preparing the drawings so that when all colors are printed one over the other the proper register will be secured. The zinc plate, which carries the design, will produce about 50,000 impressions before it is necessary to substitute a new plate.

Actual Printing by Rubber

Decorating tin plate, as practiced by the Wheeling Steel Corp., is executed by the offset printing method, so-called because the zinc printing plate curved to fit a cylinder of a press makes an impression on a rubber blanketed cylinder which in turn offsets the design on the tin plate as it passes beneath. Were it possible to use metal type for making the impressions on metal sheets or tin plate, doubtlessly this would be done. But metal type will not make an impression advantageously on a metal surface and for this reason a soft medium must be employed. Rubber has been found to be the most suitable material in this connection and hence is universally used.

Presses Accurately Made

Four presses of the rotary type are installed. Each is equipped with 3-high cylinders, which from the top to the bottom are known as the plate cylinder, the blanket cylinder and the impression cylinder. All are ground accurately to the same circumference and revolve in eccentric bushings which permit accurate and delicate adjustment. The plate cylinder is provided with easily operated clamps to permit changes and adjustment of plates quickly. Freedom from blacklash of the plate and blanket cylinders is insured by special take-up gears.

The plate cylinder, to the curved surface of which the zinc printing plate is fitted, is mounted on top and revolves counter-clockwise; the blanket cylinder, which is covered with a rubber blanket about 1/16 inch thick to provide resiliency similar to a rubber stamp, is mounted beneath the plate cylinder and revolves clockwise; while the impression cylinder, which is located beneath the blanket cylinder, revolves counter-clockwise. As previously mentioned, lithographic printing depends upon the nonmixing quality of grease and water. Applying this principle, the ink is carried from an elevated fountain by a carefully devised system of vibrating and distributing rollers to five form rollers covered with leather with the nap exposed, which in turn deposit the thoroughly digested ink on the lines of the design to be printed. The sockets for the form rollers are mounted upon gibbed bearings to insure rigidity and accuracy of adjustment. The inking rollers are provided with a lifting device which permits of a thorough inking before printing. On the feeding side of the press are two water form rollers covered with flannel which distribute slightly acidulated distilled water from a water fountain to the nonprinting surface of the zinc plate just before it is inked for each impression. The supply of water may be regulated finely at the will of the operator while the press is in operation.

FIG. 8—BOXING AND SHIPPING DEPARTMENT THROUGH WHICH 4,922,600 POUNDS OF TIN PLATE, THE YIELD FROM 22 MILLS, PASSED DURING THE LAST WEEK OF FEBRUARY

Plates Delivered Direct

Any size of tin plate or black plate from 24 x 32 inches and smaller can be handled by the lithographing division. If the size desired necessitates rolling at the adjoining hot mill department, delivery of the decorated stock usually is made within four weeks after receipt of the order, but if a standard size plate can be used a more attractive delivery is possible, depending upon the operations involved in decorating. Owing to the convenient location of the

corporation's tin mills, the product is not boxed but is transferred direct from the assorting room to the lithographing plant on a large steel transfer car drawn by an electric locomotive over a standard gage track which connects the two departments.

Automatic Feeding of Press

Before being transferred to the printing presses each sheet is cleaned by a special process to eliminate objectional features often caused by a dirty plate. The stock then is loaded onto a piling board which is rolled into position on the semiautomatic feeding mechanism. The batch of sheets then is automatically elevated so that the top sheet is just above the feeding table and the operator, who pushes it under drop rollers. These carry it forward to an automatic registering device which delivers it to grippers in accurate register. As soon as the grippers close upon the sheet, the side guides automatically withdraw, leaving free progress for the sheets even though of uneven size. The press is so arranged that if no sheet is presented to the guides the impression cylinder is moved out of contact with the blanket cylinder, thus preventing the possibility of printing on the back of the sheet or on the impression cylinder.

Meanwhile the plate cylinder, which carries the printing plate, has left an imprint of the design on the rubber blanket. As this design approaches the point of contact with the impression cylinder a sheet of tin plate is advancing and as this passes between the two cylinders the blanket cylinder offsets the design onto the material while it is in transit through the press. Approximately 3000 impressions are made per hour. The sheet with its printed side up is delivered onto leather conveyor belts in full view of the operator. It must be apparent to the reader, therefore, that the facsimile of the original design is changed from the positive to the negative form on four occasions from the original design until it is printed on the surface of the metal. It first is engraved on the stone in the positive form, mounted on the stick-up sheet in the negative, transferred to the printing plate in the positive, imprinted on the rubber blanket cylinder in the negative and offset on the tin plate in the positive.

Each press is served by a kiln through which the sheets are passed to give the coating a permanent set. Sprockets are provided at both ends of the kiln over which a chain conveyor, equipped with wire wickets spaced about 1 inch apart, operates continuously. The printed sheets leaving the press are transferred by the leather conveying belts to the wickets while in a horizontal position which support them in a vertical position during transit through the oven. The kiln is about 100 feet long and is fired with natural gas supplied through numerous upright burners arranged on the interior. Each series of burners is provided with a mixer to supply the proper amount of air for economical combustion. The baking temperature is controlled by thermostats and is recorded on charts. The products of combustion and fumes are withdrawn from the kiln through specially designed flues. In baking the coating, the aim is to maintain the proper combustion of gas and circulation of air within the kiln.

Paint Must Be Baked

Paint does not dry as easily and readily on steel as on paper because the metal lacks absorptive qualities. Therefore any pigment in the ink must be baked to cause it to adhere properly to the surface. Baking the decorated stock can be accomplished in a comparatively short period whereas to employ any air drying process would require a large amount of space to expose each sheet and would entail from 12 to 24 hours. Baking in properly designed ovens will dry the pigment and fix it to the surface of the metal in ½ to 4 hours, depending upon the material employed and the purpose for which the decorated stock is intended.

Each Color Printed Separately

As the sheets leave the baking kiln they are cooled to a temperature suitable for handling, by currents of air directed from both sides and from beneath. Each color printed requires a separate run through the press so that the number of printings entailed in a lithographing job is contingent upon the number of colors used. The work of printing a two or more color job at the Yorkville plant is expedited by employing the entire battery of presses. After the batch of sheets contained in an order is given its initial printing and baking, the sheets are started through No. 2 press and oven and then routed through as many more of the presses and kilns as required to complete the decorating job.

After the sheets leave the ovens they are removed from the wickets and piled on skids to be returned to the printing presses or coating machines at the front end of the kilns if additional color or lacquering work is to be executed, or are delivered to the inspecting and boxing department. Handling the sheets on skids is facilitated by electrically-driven lift trucks, two of which serve the department. Depressed tracks made of channels are inset in the wood block floor between kilns and these terminate at both ends in turntables to permit the distribution of stock to any particular printing press or coating machine.

All stock decorated by the corporation is shipped to assembly plants in this country which specialize on lithographing work but have no facilities for decorating. The material is shipped in the flat state, usually packed 112 sheets to the package ready for the assembling machines. In packing the product for shipment each wooden box is lined

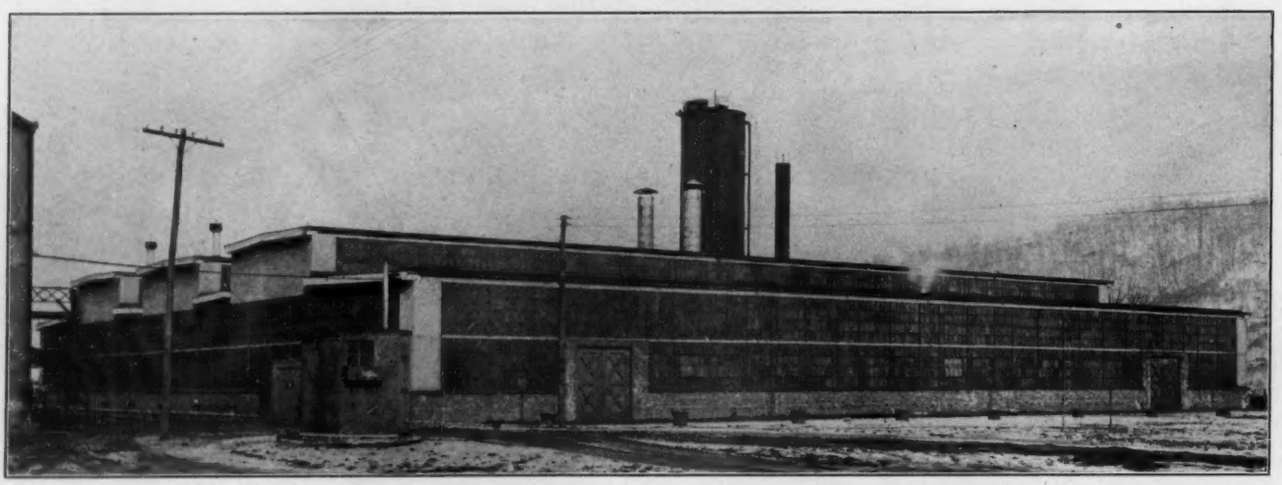


FIG. 9—LITHOGRAPHING BUILDING WHICH PARALLELS THE TIN MILL STRUCTURE

with a special grade of paper while the top and bottom sheet of the pack is covered with waxed paper before the lid is nailed down.

Much of the success in lithographing metal depends upon the baking process. A wide knowledge of critical temperatures and partial pressures is essential in order that the coated surface will be dried from the bottom upward and will not be rendered brittle. Upon completion of the final baking process or months afterward, the decorated sheet or tin plate can be bent both ways of the grain and the creases flattened down with a hammer without effecting a break in the coating. In fact, the coating will withstand as much punishment as the steel.

All coating material and enamel used by the lithographing department to secure the various colors demanded in specifications are ground, mixed and strained in a room set apart in one corner of the building. Flanked along one side is a tier of shelving upon which numerous cans of expensive pigments are stored. Three electrically-driven mixing machines are provided. Practically any shade of lacquer or enamel can be compounded by the mixing crew whose knowledge of the art is rather involved.

An important problem associated with the art of lithography is to obtain definite colors. To accomplish this end correct pigments must be used and special attention given to the mixing process. Prior to the late war a large portion of the pigments used in this country were secured from abroad so that when relations were severed the supply automatically was shut off. Experiments conducted by American paint and ink producers resulted in the production of colors on a par or somewhat better than those compounded by foreign makers. As a result of research in this connection it now is possible to produce approximately 2000 shades of red. The number of shades of an individual color that now can be produced practically is unlimited and for this reason various colors have been standardized. Each year a card, known as the standard color card of America, is issued showing about 132 delicate shades of various colors on ribbon.

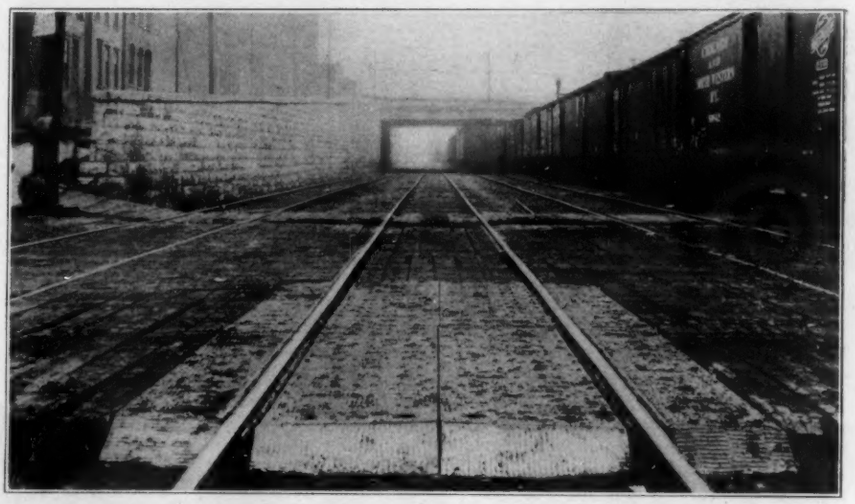
Only Prime Stock Is Used

It must not be thought, however, that the work of the lithographing crew can produce good decorated stock unassisted. The crew demonstrates the value of its work in grinding and mixing the pigments from which the various colors are produced and in preparing the zinc plates for metal printing. But unless the tin plate or steel sheets are of prime stock and due care is observed in the various steps through which they pass in the hot mill, pickling, annealing, cold rolling and tinning departments satisfactory decorating results are not always possible to obtain. Consequently all sheets and tin plate which are decorated at the Yorkville plant are closely inspected throughout the processes of manufacture. Moreover, it is important that the lithographic department should know the exact purpose for which the stock is to be used and whether it is to be subjected to shallow or deep drawing, for in some cases better results are obtained in processing the metal along the grain while in others the coating is more satisfactory when applied across the grain. The advantage of entrusting this knowledge to the lithographer is that it permits the selection of the proper grade of steel best adapted to the customer's requirements.

For certain applications a full finished steel lithographed and lacquered will withstand atmospheric conditions better than a sheet of plain tin plate. Lithographed stock intended for other than food containers is often black plate of proper drawing quality, lacquered on the side which is to form the interior of the box. Stock for bottle or jar caps such as are used for sealing fruit juices, catsup, pickles, mayonnaise and other foodstuffs is made of tin plate and besides being lithographed is lacquered on the side which is to form the inside of the cap. The purpose of applying a coat of lacquer over the tinned covered surface is to increase the margin of safety against alkaloids which form when certain vegetable acids come in contact with tin and steel. Four coating units are installed for applying the lacquer. These are electrically driven and are served by individual baking kilns similar to those which serve the printing presses. The ever increasing demand for lacquer-protected tinplate indicates that this country is awake to the desirability of this added safeguard to health and life.

Designs Steel Crossings for Railroads

To replace wood or concrete road crossings over railroad tracks, the National Highway Crossing Co., Burlington, Ia., is placing on the market a crossing fabricated from steel. The crossing is made of wrought steel plates and is supported on the cross ties by angle plates of sheet steel. As shown in the accompanying illustration it fits snugly between the rails, is flush with the top of the rails and has a flanged groove for the flanges of the car wheels. The edges of the plates fit tightly under the ball of the rails. Lag screws driven into the ties hold the crossing down securely but by taking out the screws, the crossing may be removed in a few minutes.



THIS RAILROAD CROSSING IS MADE FROM WROUGHT STEEL PLATES AND IS CLAIMED TO BE A PROTECTION TO THE CROSS TIES

It is claimed that this type of crossing is self-cleaning and that mud, gravel, snow, sleet or ice will not accumulate on the ties. Because of the current of air circulating continually between the crossing plates and the ties, the ties are kept dry. This not only protects the ties but the crossing plates as well. In addition, the thorough ventilation is said to eliminate the freezing and thawing influences which are ruinous.

The American Engineering Standards committee, 29 West Thirty-ninth street, New York, announces that it has received copies of 1923 electrical engineering standards used by European standardizing bodies and that it is prepared to furnish copies of these standards at a nominal charge.

Preparing Wheels for Polishing

Various Grades of Grit Should Be Used Depending Upon Finish Desired on Work—Properties and Preparation of Glue, Application of Abrasive, Setting, Temperature and Storage Are Factors in Wheel Effectiveness

BY FRANCIS D. BOWMAN

THE ideal abrasive grain for polishing is one that is held in place firmly by the glue so that it is not broken away before it has performed its full quota of work. The demand for such a grain has grown tremendously during the past few years which has led producers of both natural and artificial abrasives to pay particular attention to products for polishing purposes. Abrasive grain for polishing also should be cleaned carefully for

FIG. 1—PLOW PARTS ARE POLISHED UNDER COMPRESS WHEELS

even a low percentage of foreign material lowers its cutting efficiency. Toughness is another important essential. A tough grain stands up to the work without breaking or powdering under the abrasive action. The ideal polishing grain, therefore, should be hard, sharp and tough.

The success of a setup wheel, however, is not dependent wholly on the quality of the polishing grain as other factors also are of importance. For example, the glue should be of the highest quality. It should not be bought at random. On the other hand it should be purchased from dealers who specialize in polishing room equipment. Such a company will guarantee its purity and viscosity. Cheap glue or glue that has not been prepared properly decomposes and as bacteria form such a glue loses its holding power.

The glue should be soaked thoroughly in clean, cold water. Experience has proven that when ground glue is used it should be soaked for at least two hours. Flake glue should be soaked over night. Glue never should be boiled as boiling lowers its viscosity and adhering qualities. The glue should be heated to 150 degrees Fahr., in a clean kettle, preferably one that is water-jacketed. Experienced polishers state that glue never should be heated for more than four hours. Therefore, it should be made up in comparatively small batches at a time. In setting up the wheels, experience teaches the operator the correct proportions of glue and water to use. In this respect the following data will prove helpful:

For severe work, where the polishing wheel is brought in contact with sharp corners and rough edges and for work where 24 to 36 grits are used, the ideal proportion is one part water to one part glue.

For less severe work, where the corners of the pieces are round and the surfaces plain and where 24 to 36 grits are used, the proportion should be 5 parts water to 4½ parts glue.

For similar work where 36 to 54 grits are used, 5 parts water to 4 parts glue is satisfactory.

For similar work where 60 to 80 grits are used, 5 parts water to 3½ parts glue can be employed.

The foregoing will serve as a general guide, but local conditions may subject the proportions to slight changes.

The proper setting up of the wheels also is important and as this has a direct bearing on production, it is recommended that special men be detailed to the job. The work should be carried on in a room designed for this purpose. The surroundings should be clean and dry and the temperature should be maintained at from 75 to 85 degrees Fahr. The circulation of air should be good, but chilling drafts must be avoided if good work is expected.

The correct storage of the abrasive grain also is important. It should be kept in a clean, dry room away from dust and dirt. Each keg or container should be covered carefully for if a small quantity of No. 36 grain, for example, should be mixed accidentally with No. 80, a wheel set-up with the latter grain would leave deep scratches.

Details of Practice

In making up the wheels both the wheels and the grain should be heated to a temperature of between 75 and 85 degrees Fahr. before the wheel is coated with glue. The glue should be applied quickly and the wheel should be rolled in the grain which can be placed in a trough provided for the purpose. After the wheel is thoroughly covered it should be rolled lightly over a hard surface to set the grain. Some operators roll in the grain under pressure with excellent results. The set-up wheels should be permitted to dry for at least 10 hours when single coatings have been applied. Where double coatings are used the wheels should dry for at least 24 hours before being used. The drying should be done in a clean, warm room heated to approximately 85 degrees Fahr.

The selection of polishing wheels is important as no one wheel can be used for a diversity with the best results. Types of polishing wheels used for various purposes vary as the accompanying illustrations show. The operation in Fig. 1 consists of polishing

The author is advertising manager of the Carborundum Co., Niagara Falls, N. Y., manufacturer of artificial abrasives and grinding wheels.

steel plow mold boards. This is exacting work as all the surface imperfections must be removed. As the illustration shows the work is located on a movable cradle that can be passed back and forth under the wheel. The wheel used in this instance is of the so-called compress type which is made of layers of leather located radially and held in place between two steel disks.

Careful Polishing Necessary

Fig. 2 illustrates the polishing of stove parts. The rough castings must be smoothed carefully, especially if the parts are to be nickle-plated. For rough polishing, glued canvas wheels generally are used. Compress leather wheels also can be employed with good results. Buffing after plating generally is performed on stitched muslin wheels.

The operators in Fig. 3 are polishing plumbers brass goods. A diversity of wheels can be used for this purpose. White felt polishing wheels set up with abrasive grain are used frequently for rough polishing. These wheels are resilient to a certain extent so that they conform to the shape of the work. Where harder wheels are needed, bull-neck leather can be used to advantage. Such wheels can be shaped to conform to irregularities of the work and they possess the additional advantage of not breaking down rapidly on the corners. In selecting wheels and abrasives for polishing and buffing purposes it is a good plan to consult the wheel and abrasive makers' representatives. These men have had wide experience and are in position to offer valuable suggestions.

FIG. 3—PLUMBERS' SUPPLIES REQUIRE EXTENSIVE POLISHING

The Atlas Tack Co., Fairhaven, Mass., reports for the year ending Dec. 31, 1923, net profits of $555 compared with $130,270 in 1922. Current assets are given as $1,240,000.

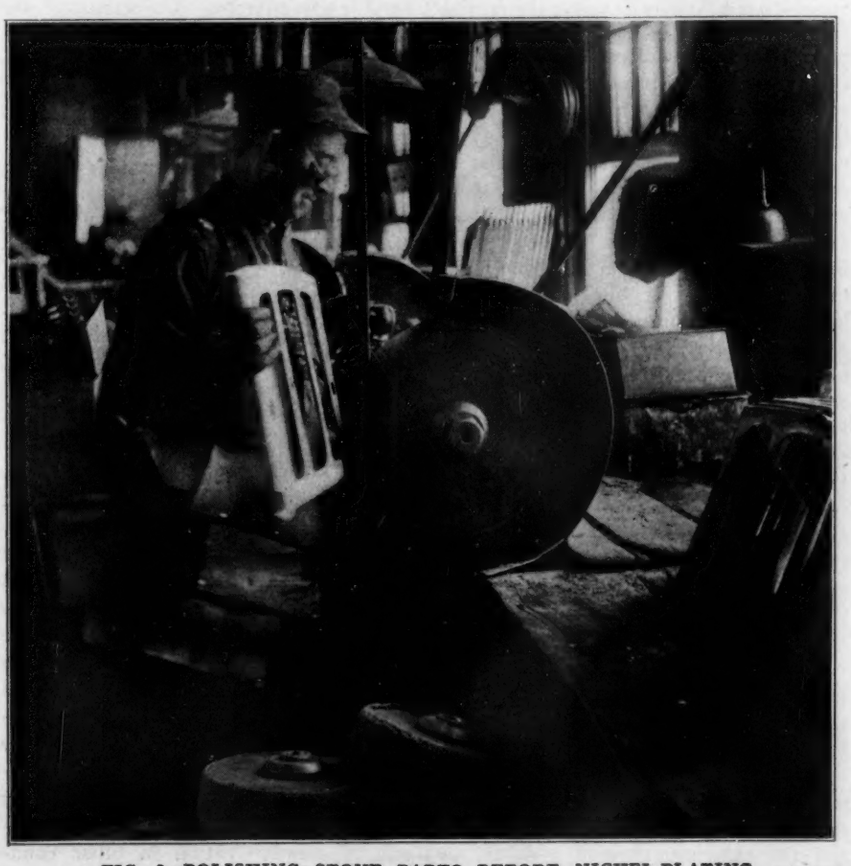


FIG. 2—POLISHING STOVE PARTS BEFORE NICKEL-PLATING

American Engineers Will Go to London

A large number of prominent American engineers and manufacturers have indicated their intention of going to London in June and July to attend the British Mining and Metallurgical congress, the World Power conference, and the British Empire exhibition. Among those who have signified their intention of sailing are: W. A. Doble, chief engineer, Pelton Water Wheel Co., San Francisco; W. L. R. Emmet, consulting engineer, General Electric Co., Schenectady, N. Y.; John R. Freeman, consulting engineer, Providence, R. I.; F. M. Feiker, vice president, Society for Electrical Development, New York; Francis Hodgkinson, chief engineer, Westinghouse Electric & Mfg. Co., Pittsburgh; D. S. Jacobus, consulting engineer, Babcock & Wilcox Co., New York; Charles F. Rand, New York; William L. Saunders, chairman, Ingersoll-Rand Co., New York; Ambrose Swasey, Cleveland; Guy E. Tripp, chairman, Westinghouse Electrical & Mfg. Co., Pittsburgh; and Owen D. Young, chairman, General Electric Co., Schenectady, New York.

Collects Statistics on Use of Tungsten

Quantities of tungsten consumed or stored in the United States never have been known definitely. For this reason the geological survey undertook to gather some statistics as of Nov. 1, 1923. Since some difficulty was experienced in gathering this informa-

tion, the figures have just been made available. The quantities of tungsten used in lamp filaments, contact points and chemicals is so small in comparison with the quantities used in steel making, that they little affect the general market. In preparing its figures, the geological survey reduced all items to their equivalent in short tons of ore carrying 60 per cent of tungsten trioxide.

"Used ore" indicates ore put in a final product, such as tool steel, lamp filaments or chemicals. Ferrotungsten and tungsten powder are regarded as intermediate products in the preparation of the ore for use. "Stocks on hand" include all items in the hands of producers, investors and users and in warehouses. In estimating the quantity of ore represented by a given quantity of tungsten powder or ferrotungsten, the tungsten in these products has been multiplied by 2.5 on the supposition that under the average metallurgical practice about 800 pounds of tungsten is recovered from a short ton of ore carrying 60 per cent of tungsten trioxide.

Consumption of tungsten between Sept. 22, 1922, the date when the present duty became effective, and Nov. 1, 1923, was found to be 2302 tons of ore, 1257 tons of powder, 3471 tons of ferrotungsten, 2465 tons in scrap steel and 75 tons in scale and chemicals, making a total of 9570 tons. Allowing for errors in overestimates and resales, and quantities used after Nov. 1, it is estimated that the total used in 13 months was 8700 tons. Tungsten on hand Nov. 1 was found to be 7087 tons in ore, 946 tons in powder, 1250 tons in ferrotungsten, 850 tons in steel scrap and 26 tons in scale and acid, making a total of 10,159 tons. The corresponding figure on Sept. 22, 1922, is estimated as 15,333 tons. The geological survey states that the quantity of tungsten used in steel during the 13-month period probably was fully the 8700 tons indicated. The figures indicate a consumption of about 8000 tons per year, which is more than in any other year except the last year of the world war when special steels were needed.

Weigh Factors in Hot-Working Steel

DR. PERCY LONGMUIR, of Wortley, near Sheffield, England, recently director of research to the British Cast Iron Research association, gave a lecture Jan. 17 before the Staffordshire Iron and Steel institute at Birmingham university entitled, "The Effects Occurring in the Hot-working of Steel." Dr. Longmuir explained that for the special purpose of the lecture he had had prepared samples of steel treated in various ways. The results were shown in diagrams exhibiting the result of heating at different temperatures.

Dr. Longmuir said that every worker in hot or molten metal has to deal with difficulties arising from air bubbles and all sorts of different results arise from the varying temperatures at which metal is heated. Although many textbooks give formulas for heating, the correct temperature must vary with the metal employed and the section dealt with. No textbook can give the correct temperature for any given alloy or metal; it all depends on the section to be treated. The same principle applies to annealing in connection with the white iron used in malleable castings. Steel is extremely difficult to superheat without introducing at the same time disturbing conditions. It is possible with steel to get different effects in tensile tests, merely by varying the heating. The effect on the packing of crystals is such that practically any range of structure can be obtained by heat variations alone. Incorrect heating, with the best Sheffield steel is apt to develop a crack in the center of the bar, which would not be removed in all the subsequent operations, and is liable to contain ferrous oxide. When such steel is cold rolled the result is hopeless.

Another effect frequently met with, said Dr. Longmuir, is the development of soft patches in such products as milling cutters due to decarbonization before the cutter is finished. Slag inclusions are a fruitful cause of breakdown in cold-worked material, and segregation in the center of wire rods produces a lot of failures in wire. This is often due to extreme heat. Disks of 18 per cent tungsten steel are often burst in the center by bad forging but they are sometimes ruined by overheating.

Make Progress in Cold Working

Dr. Longmuir declared that enormous developments have taken place in the cold-working of steel, although, he said, he does not accept the statement that the drop forger will oust the foundryman, who will still be called upon to supply intricate castings. Cutting steels are now being used at a very high rate of speed, this severe treatment making greater demands on the quality of the metal. Cutting steels are usually improved if oil quenching is substituted for water quenching. An alloy containing 5 per cent nickel with 0.2 per cent carbon was formerly much favored for crankshafts and gave very good results in impact and elongation tests. Iron-chromium alloys are being developed in steelworks to a considerable extent and there are equal possibilities for the use of these alloys in iron foundries, if the necessary amount of experimental work could be undertaken and properly executed.

The mysterious cuppiness sometimes found in wire is usually due to a bad center which in drawing refuses to follow the outside flow of the metal.

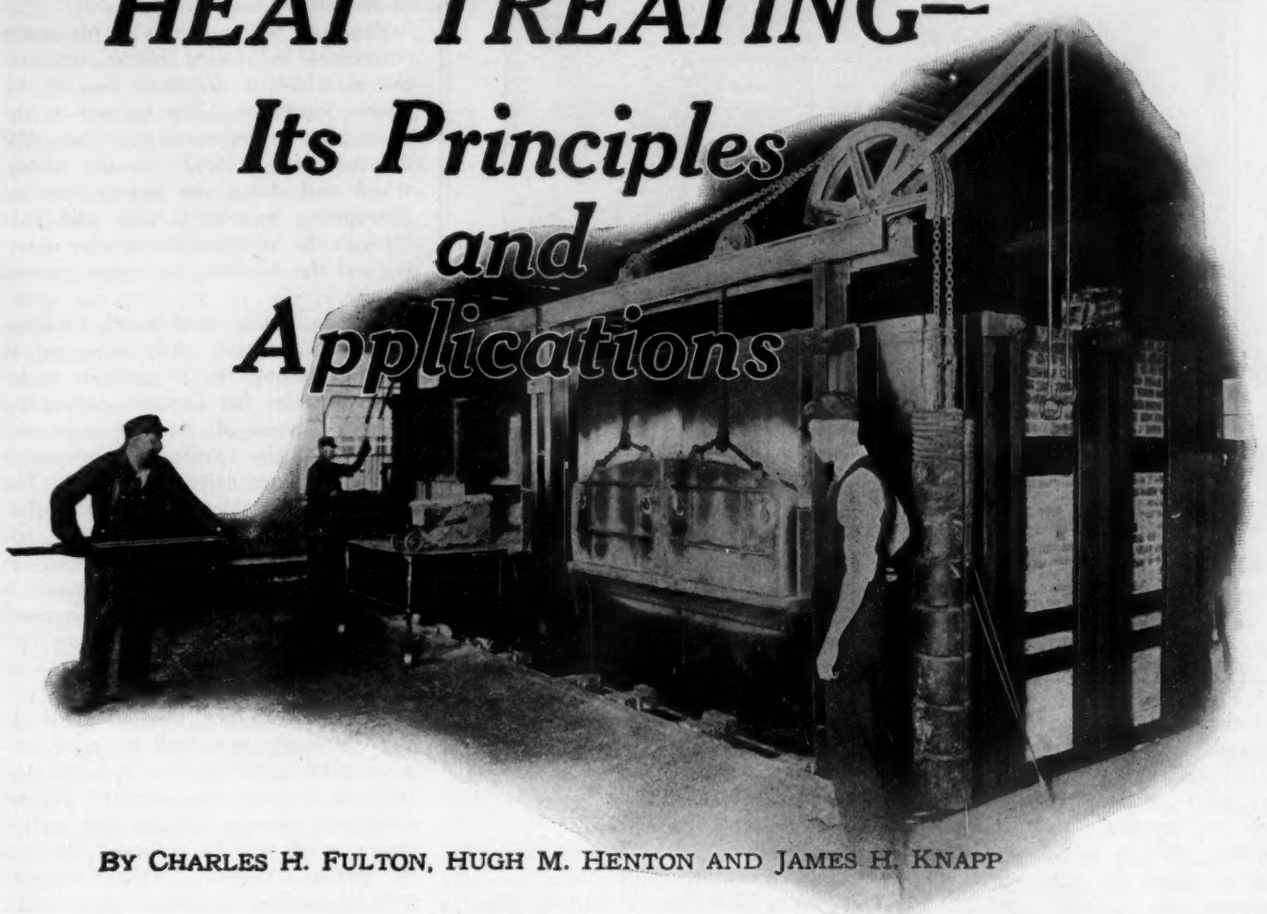
Dr. Longmuir said the most useful results are those obtained in practice rather than under laboratory conditions, and the experimenter always should be prepared completely to change his ideas as the result of experience. He remembered saying once that the microscope could solve all their problems; but he now believes no simple method would serve. With regard to soft spots in gudgeon pins, in most cases it would be found they are due to decarbonization in the previous working of the metal.

As to wire breakdowns, if he had been speaking two months earlier he could have said that no British miner had ever lost his life through the breaking of a wire rope. Unfortunately the recent accident to the "Paddy Mail" at the Nunnery Colliery, Yorkshire, involving loss of life had broken the record. But he still hoped that when the investigations were complete it would be found that the accident was not due to the failure of the rope itself, though there is always danger from the overdrawing of wire. The margin is narrow between safety and overdrawing. Fortunately from the user's point of view, the narrowness of the margin is a safeguard since this defect is instantly shown in practice.

Japanese Standardizing

Standardization of material in Japan will proceed along the lines of structural steel, brick and lumber, as the government believes this will aid in the work of rehabilitation. The department of commerce is informed the Japanese committee assigned to the work by the imperial government has been making progress and has determined upon gages of wire and sheets. The committee has submitted recommendations to the minister of agriculture and commerce. Methods of standardization in other countries are being studied.

HEAT TREATING—
Its Principles and Applications



BY CHARLES H. FULTON, HUGH M. HENTON AND JAMES H. KNAPP

Chapter V—Normalizing and Annealing (Concluded)

FURNACES of the open-chamber type where products of combustion strike directly upon a box or pot in which articles are packed are not favored for steel because the packing boxes have to be replaced often as they deteriorate rapidly when subjected to a direct flame. Moreover there is little possibility of correctly measuring the temperature, which is important in any annealing operation. Large furnaces of good design have a combustion chamber separate from the heating chamber either at the side or overhead. The hearth is separated by a system of checkwork flues in furnaces of the solid-hearth type or by a movable hearth for handling heavy work in car-type furnaces.

A over-fired car-type furnace is illustrated in Fig. 43. Gas or atomized oil mixed with air enters an overhead combustion chamber just under the main arch. Here complete combustion takes place. The hot gases are forced through a perforated arch of high-test firebrick and move downward, spreading uniformly over the entire heating chamber. The vents at the side receive the spent gases after almost all possible heat energy has left them. From the vents the gases pass into flues that are controlled by independent dampers and are entirely outside the furnace walls. This construction insures a stronger wall than when the flue passes up directly through the wall. This design also eliminates the loss of heat which is bound to occur in furnaces having a flue in the wall, since in that type heat passes through the brick directly into the vent where the flue passes the chamber.

The hearth on the movable car is composed of high grade firebrick laid over an insulating material. A sand seal is provided all along the ends and sides to prevent the escape of heat and to protect the frame and bearings of the car.

The furnace door fits into the sand pocket in the end of the car. Openings are provided in the side of the furnace for pyrometers covered by wickets, so that the thermocouple reaches the work about midway between the top and bottom of the parts being treated. Peep-holes are provided. The heavy door is handled by chain and a handwheel and is counterweighted.

All exposed parts such as the arch

Discuss Pyrometers and Fuel Consumption

CHAPTER V on normalizing and annealing is concluded in this issue with a discussion on the design of large furnaces, control of temperature and fuel consumption. Electric furnaces will be considered in Chapter IX. Chapter VI on hardening and tempering will begin in the issue of April 3.

Chapter I of the series appeared Oct. 4; Chapter II was published in the issues of Oct. 18, Nov. 1 and Nov. 15; Chapter III in the issues of Nov. 29, Dec. 13 and Dec. 27; and Chapter IV in the issue of Jan. 10. Chapter V thus far has appeared in the Jan. 24 Feb. 7, Feb. 21 and March 6 issues.

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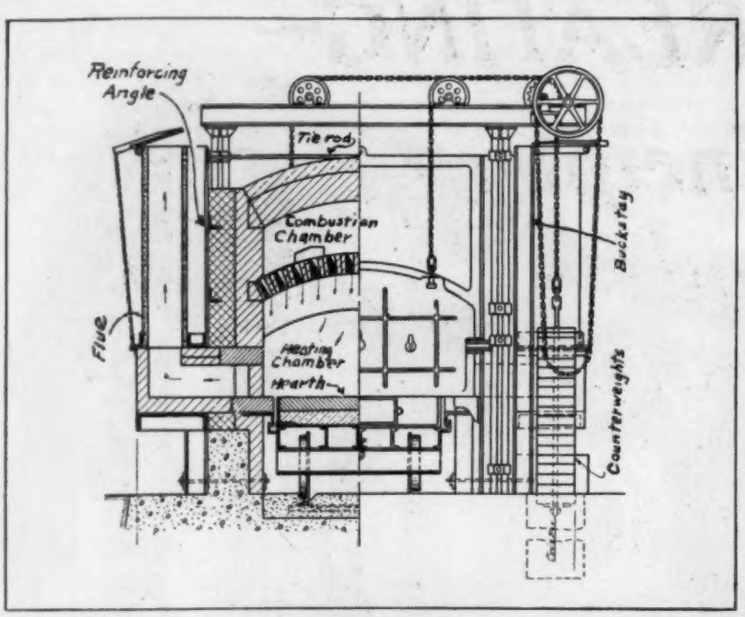

FIG. 43—SECTIONAL DRAWING OF OVER-FIRED CAR TYPE ANNEALING FURNACE

and the door are made of high grade firebrick which is made almost monolithic by applying a wash of fire clay as a finish. The bricks of the arch are ground to fit closely and are laid "skin to skin," with the thinnest of good fire clay as a mortar. Between the firebrick and the iron or steel plates of the frame is a layer of insulating brick. The ends and sides of the furnace are bound by angle irons, iron channel buckstays holding the thrust of the arch by means of rods and a reinforcing angle along the sides opposite the spring of the arch. Different designs are employed to meet varying conditions and, therefore, sometimes the outside wall is of brick. Fig. 44 shows an over-fired furnace 7 feet wide by 20 feet 3 inches long. This unit is used for annealing high grade tool steel.

Design of Side-Fired Units

Fig. 45 shows a medium sized, side-fired furnace of the car-type which is used for chain annealing. It is practically a semimuffle furnace and does good work with uncovered steel chains with a surprisingly low consumption of fuel. Combustion takes place in the chamber at one side. Heat passes over the bridge wall, follows the arch and is evenly distributed over the hearth. In the solid-hearth type, spent gases travel through flues under the hearth before passing out, helping to heat it from below. In the wider furnaces, combustion chambers are placed at both sides.

Depending on chamber widths, side-fired furnaces can be readily installed in pairs with a solid firebrick wall between the heating chambers. This forms a double-chambered furnace. Oil or gas or a combination of each may be used with this type of furnace and no stack is required.

Side-fired and over-fired types of furnaces can be equipped with two cars to work continuously with a door in each end. One car may be loaded while the other is in the furnace, so that a minimum of cooling takes place at the time of the change. Automobile parts, as well as chains for heavy work, can be handled rapidly in this way. Steel chains must be heated uniformly and thoroughly because a chain is only as strong as its weakest link and one cool spot in the furnace would cause serious trouble.

Forgings of medium size often are normalized in sloping hearth furnaces, one of which is shown in Fig. 46, by double treatment. The furnace at the right gives a temperature of about 900 degrees Cent. (1650)* to the pieces, which roll down the hearth into an appropriate quenching bath and pass through the left hand furnace for drawing out the hardness to a fine grained sorbite.

In many cases solid-hearth furnaces have bars or skid pipes imbedded in the top among the firebrick in order to help resist the abrasion caused by pushing pieces of steel through the furnace. This effects a considerable saving in expensive firebrick. The massive and stable character of solid-hearth furnaces appeals to many operators because a greater saving in the sensible amount of spent gases is possible than in the case of the moving car types.

Routine for Double Treatment

Perhaps the best way to illustrate the operations in a well designed furnace is to follow a piece of work step by step through the furnace. As an example a piece of 0.90 per cent carbon spring steel will be followed through its double treatment. This discussion will be confined to plain carbon steel, the treatment of alloys being reserved for a later chapter. The treatment results in a normalized structure, as a full anneal destroys the toughness and resiliency or springiness.

The steel is received in bars which are cut into lengths about 5 feet long.

*Temperature in Fahrenheit is shown in parenthesis.

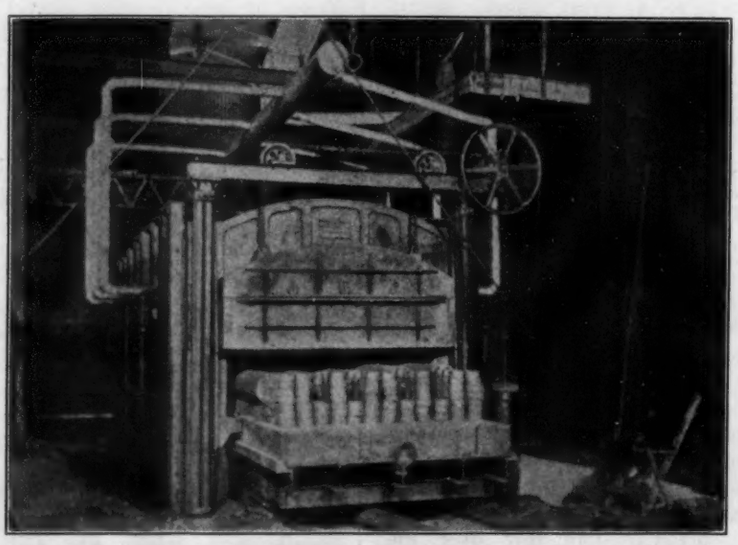

FIG. 44—AN OVER-FIRED CAR-TYPE FURNACE 7 FEET LONG AND 20 FEET 3 INCHES DEEP

A loop is forged on each end of certain leaves after heating to 750 degrees Cent. (1400). The springs are formed and laid upon the hearth of a continuous movable hearth-type furnace. The temperature of the heating chamber is held constantly to 775 degrees Cent. (1427) and the hearth moves just fast enough so that the attendants at the far end of the furnace can receive the heated springs conveniently. As the leaves emerge they are fastened in vertical forms which keep them separated so that all surfaces will be accessible to the quenching oil. The quenching, which takes place before the temperature of the springs has dropped to 730 degrees Cent. (1350), causes all parts to become nicely troostitic.

The pieces are removed from the quenching bath, the leaves being assembled and placed on the moving hearth of a low-temperature drawback furnace which reheats them very slowly, by careful pyrometer regulation, to not over 550 degrees Cent. (1022). The pieces then are taken out to have the scale removed and to be ground, finished and tested for deflection. This test varies with the requirements and design but is standard for each order. It readily detects any irregularity in the treatment used, but often a number of laboratory tests including microscopic examination are necessary to locate the responsibility for faulty procedure.

Locating Pyrometers Important

The use and method of locating the pyrometer is extremely important. The thermocouple is placed in various positions under different conditions. As the gases moving about the work are hotter in the heating period than the work, and probably continue so all through the operation, it requires good judgment to determine the logical place for the couple. Thermocouples inserted through the arch or the walls of a furnace should not extend into the chamber more than one inch and in some cases not that far if there is a rapid eddy of hot gases at that point.

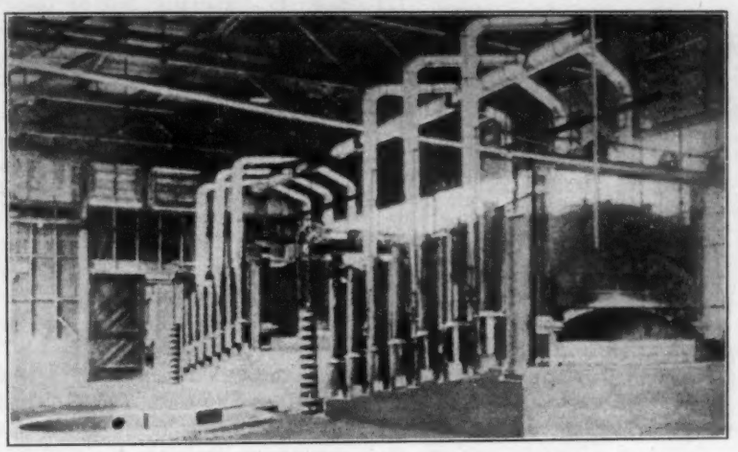

FIG. 46—A SLOPING-HEARTH FURNACE WITH HIGH AND LOW TEMPERATURE UNITS

In an under-fired furnace couples placed through the back wall and fitting into a recess in the hearth, as shown in Fig. 47, are out of the way of moving gases and give accurate readings of actual furnace temperature. Where it is possible, as in some heating operations when the material is packed in boxes or in the case of large pieces, the couple can be inserted through the arch or furnace wall into the box or into a hole drilled in the piece being heated. This, of course, is the ideal condition but in many cases is impossible.

Thermocouples today are made robust for every day use, and cheap enough to be everywhere accessible. Base metal couples should be so arranged that parasite currents and variable cold junction temperatures are properly balanced, as variations are liable to occur at any time. All instruments should be standardized against noble metal couples, themselves calibrated by the melting points of pure metals as copper and lead. Continuous records of temperature performance of furnaces should be kept from recording instruments which permit several curves to be traced on one sheet. This is not easy where furnaces operate at nearly the same temperature, but can be accomplished without trouble with a high-temperature and low-temperature furnace, for instance.

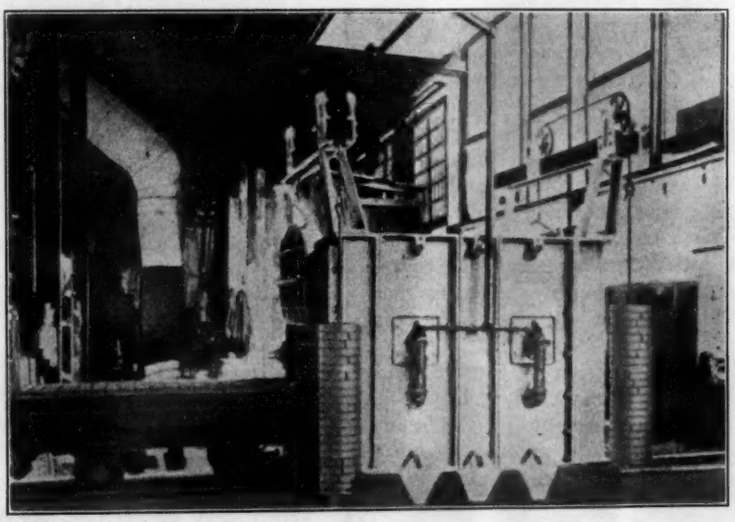

FIG. 45—A MEDIUM-SIZED, SIDE-FIRED FURNACE OF THE CAR TYPE

Human Element Is Factor

Optical pyrometers used through peep-holes do not give a record, but they help furnacemen to keep watch of their work and install a habit of observing. No mechanical device can be substituted for the watchfulness and keen interest of the human eye and mind. A ruled chart for observations during the run should hang where the furnace tender can jot down short items quickly. All couples can be connected to the office like separate telephones so that each time the engineer in charge wants to know how the furnace is going he can get a reading parallel to the one at the furnace.

It would be worth while for any furnace foreman to introduce Seger cones at different places in the furnace, whenever and wherever opportunity offers, as a check on the maximum temperatures. The cones are cheap and easily identified by numbers in the thicker portion which is rarely lost in the melting of the tip. A fire

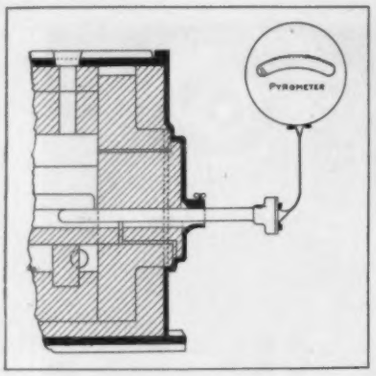

FIG. 47—METHOD OF LOCATING THERMOCOUPLE

clay slab with small holes ground in a quarter inch gives an excellent support for the cones. It is surprising how helpful these devices can be, especially beyond the limits of accurate vision.

After solving the problem of temperature control, the next important factor is the amount of fuel consumed in annealing. What effect do changes in thickness and grade of refractories have upon fuel? How much insulating brick should be used outside of the firebrick? What is the best means of obtaining an atmosphere not injurious to tools? The fuel bill will be much greater if insulation is poor, and also if it is necessary to maintain a large excess of smoky, unburnt fuel just to protect the work from oxidizing by air let in through unnecessary openings.

The thickness of the refractory lining and that of the insulating brick plays an important part in fuel economy. Fig. 48 shows the thickness of furnace wall in inches, the firebrick being indicated by unshaded squares and the insulating brick by the shaded portions.

Insulation Is Effective

The diagram at the top shows that with a layer of insulating brick one-half the thickness of the firebrick, when the temperature at the inside of the wall is 872 degrees Cent. (1600), the temperature at the outside is 143 degrees Cent. (290). The diagram at the bottom shows that when the temperature inside is the same as in the previous case but when the entire lining is of firebrick, even though it is one-third thicker than the previous lining, the outside temperature is 232 degrees Cent. (450).

The effect of this insulation is clearly shown in Fig. 49. Line *A* represents the furnace at the top of Fig. 48, while line B represents the furnace at the bottom of Fig. 48. The fuel consumption can be compared fairly in different designs of furnaces only by reducing the figures down to a common unit of space available for work. Fig. 49 shows the consumption of 600 B.t.u. gas for each 100 cubic inches of workable space. Of four different standard makes of small gas furnaces the furnace designated as *A*, by virtue of its superior lining and correct design, uses one-third less gas per hour to operate than the best of the other three furnaces. Of the less efficient furnaces, that represented by line *B* used four inches of fire brick while *C* used 1½ inches firebrick and ½ inch of insulation.

The temperature was 872 degrees Cent. (1600) and furnace *A* used less gas in heating to this temperature and less gas in maintaining it at that point. Readings were taken with all parts in

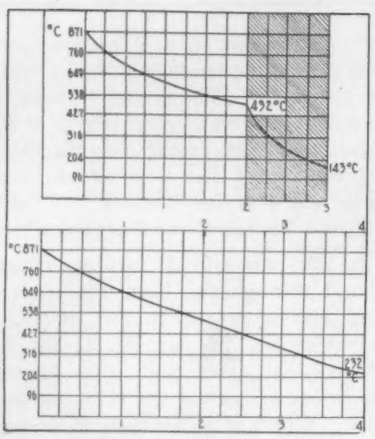

FIG. 48—HEAT CONDUCTIVITY OF INSULATED AND UNINSULATED FURNACE WALLS
(White space, firebrick; shaded space, insulation)

equilibrium, observations being recorded at six spots, namely combustion chamber, heating chamber, vents, two points in the side wall and one in the outer casing.

With gas running short in some sections of the country, and with new districts starting furnace work where no gas is found, there has come an increasing demand for oil-burning furnaces. In many places oil has been used for a long time because of its ease of handling, cleanliness and cheapness in comparison with coal. It has never been able to compete successfully in localities where coal is cheap. Perhaps one reason is the claim that one-fourth of the oil used each year is wasted.

With proper design of furnaces and with efficient burners oil fuel can be used with a prospect of splendid economy. The burner should atomize the oil so that it presents a large surface for oxidation when the kindling point is reached. The correct admission of the air for atomizing and also for complete combustion is a delicate mechanical problem which has been solved in only a few of the burners on the market. Thirteen hundred and fifty cubic feet of air is required for a gallon of ordinary fuel oil, but an excess generally must be used in order to completely burn it. In annealing and heat-treating it is preferable to have a slight excess of oil rather than air to maintain an atmosphere in the heating chamber that will not scale or oxidize the work excessively.

Oil Has Many Advantages

Oil is ideal for atmosphere regulation. The heat-treating furnace presents an ideal place for burning oil because of the hot interior where no soot can be deposited as is the case in steam-boilers. If the operator desires to cut oil costs, he can maintain the reducing atmosphere for small pieces by packing them in boxes out of direct contact with the heating chamber, and the oil can be burned with just the correct excess of air. A reducing atmosphere is secured by packing in charcoal; a neutral heat by clay; an oxidizing one by iron oxide and lime.

Pack annealing for steel may serve an additional purpose of protecting the small sections from over-annealing in comparison with the large. Where flame or radiant heat impinges on a

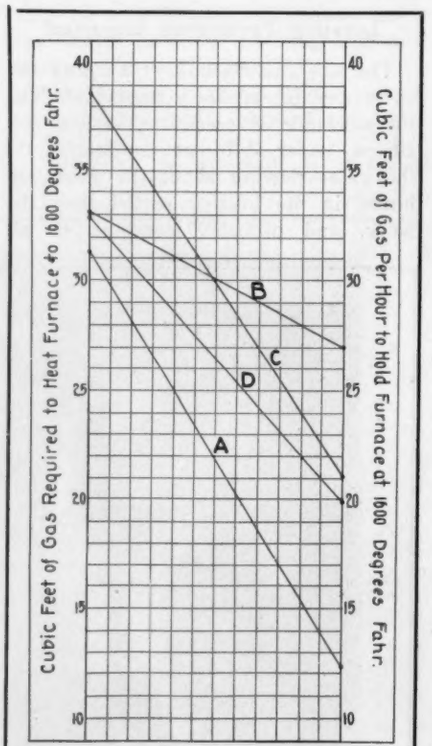

FIG. 49—CONSUMPTION OF 600 B.T.U. GAS REQUIRED PER 100 CUBIC INCHES OF WORKING SPACE AVAILABLE

thin part, it is liable to become overheated, for which witness the laboratory melting of thin slivers of rocks and minerals that are refractory when in larger pieces.

Effect of Burner Design

Too great an excess of air admitted is a fault of some type of burners, and cannot always be detected until the furnace is unduly cooled except by the pyrometer. Burners for oil are steam atomizing, air jet, or mechanical. Steam types are outside and inside mixing. Both are successful though, of course, steam takes away sensible heat if any appreciable quantity is used. Air jet burners are of high pressure and low pressure types and the best efficiency ordinarily is obtained by a combination of the two. Mechanical burners, at present, at least, seem to take too much additional equipment.

For those who are still using gas but expect to change to oil in the near future, a combination gas and oil burner may be used. It is quickly changed from gas to oil by closing the gas valve and opening the other two. Compressed air or steam atomizes the oil, while low pressure air can be used for the gas. By one lever the fuel and steam or air is regulated, saving the regulating of two valves. By this device capacity is increased, less compressed air or steam is used, noise is cut down, and atmosphere is maintained hot or mild, oxidizing, reducing, or neutral, as desired.

Oil for annealing furnaces and in fact all commercial furnace work should be heated, especially if it runs heavier than 20 degrees Baume, gravity. The oil should be brought to the burners under uniform pressure and piping should be designed without dead ends and with a return line back to the storage tank so that oil can be kept in circulation at all times.

Comparing Fuel Costs

The cost of oil in comparison with other fuels is given in Table XII. The first column gives the price of oil per gallon. The second column shows the highest price that can be paid for high grade coal to be as cheap as oil. The third column gives the highest price that should be paid for low grade coal, and the last column the highest price to be paid for gas if gas fuel is not to be more expensive than oil fuel.

The table has taken into account the actual available heat obtained per unit of price, not simply the comparative values in heat units. Besides the advantages of convenience in handling and storage, oil uses a smaller volume of air to completely burn, and wastes no carbon in ash and in particles mechanically carried up the flue without burning. The influence of local conditions make further fuel discussion superfluous here in this chapter.

Table XII

Comparative Costs of Oil, Coal and Gas

Oil	High Grade Coal	Low Grade Coal	Actual Gas
Cents per gallon	Dollars per ton	Dollars per ton	Cents per 1000 cubic feet
1	1.49	1.21	7
1¼	1.86	1.52	8½
1½	2.23	1.82	10
1¾	2.60	2.12	12
2	2.98	2.42	13½
2¼	3.35	2.73	15
2½	3.72	3.03	17
2¾	4.09	3.33	19
3	4.46	3.64	20
3½	5.21	4.24	24
4	5.95	4.85	27½

It has been proved by tests in boilers and various types of furnaces that oil can be burned with from 15 to 25 per cent more efficiency than coal due to the fact that with oil complete combustion of all the oil can be obtained With coal, considerable heat and unburned carbon is lost in the ashes.

The principal points brought out about normalizing and annealing are summarized as follows:

1. Previous history of steel determines its response to correct temperature and time.
2. The structure obtained is the finest grained when a decided maximum temperature and time just above the critical point are not exceeded.
3. Physical properties increase in measure when the grain size decreases.
4. Size causes an increase in heating time of a quarter hour to the inch diameter, in holding of a half-hour to the inch, with but slight comparative increase in cooling time.
5. Correct fuel, correct burners, correct insulation, and correct shape, size, and strength of parts, are the most important factors of good furnace design.
6. Convenience characterizes good furnace operation.
7. The pyrometer is the "eye" of furnace control.
8. Coal cannot compete with gas and oil for heat treatment of steel.
9. Comparative costs on fuel must consider the cost per unit of finished output; not the cost per B.t.u. of the different fuels.

Thus far no mention has been made in this series of electric furnaces for heat treating. A thorough discussion of electrical heat will be presented in Chapter IX.

Magnetic Cable Testing Makes Progress

An investigation of the possibility of developing a nondestructive test for wire rope in hoisting service has been under way at the bureau of standards, Washington, since last July. In view of the fact that the advisory committee decided that magnetic methods should be given first consideration, it has been found necessary to obtain certain fundamental information not heretofore available before proceeding with the design of field apparatus. First, it was necessary to consider the effect of stress on magnetic properties, since a hoisting rope in place always is under stress of varying magnitudes, according to the position of the load.

A method of analysis has been discovered which appears to be capable of indicating the relative proportions of the material which are under tension and under compression. This work also has demonstrated, apparently, that the difficulty heretofore experienced in attempting to find the laws of correlation between magnetic and other physical properties can be attribtuted to the effect of stress, as the magnetic properties are extremely sensitive to this influence. Preliminary work also has been done on the effects on the magnetic properties of various factors causing deterioration of the steel wire from which the rope is made.

To Aid Manufacturers by Research Work

In furthering research and research facilities throughout Connecticut the Manufacturers Association of Connecticut has developed a plan for cooperation with the Yale university. The plan aims to enable industries to secure more easy and direct access to the facilities which Yale university possesses for the carrying out of scientific and technical research. It also aims to make it easier for manufacturers to secure the services of young men technically trained along lines of special importance to particular industries. On the other hand, the plan aims to afford the university an opportunity to render a more effective service to the community to bring students and staff into closer contact with the practical applications of industry through the investigation of practical problems arising in the industries. Heretofore investigations have been carried out by members of the staff in such time as they

could spare from their regular duties Manufacturers as a rule however, have not generally known that such work or such co-operation could be secured.

The plan contemplates the co-ordination of existing laboratories and existing research work to the end that results once obtained will benefit a large number. In many cases manufacturers will loan special machinery and apparatus to the university where tests will be made, the results of which will be made available to the manufacturer.

To bring this to a head an industrial research bureau has been organized. This bureau is governed by two committees, one appointed by the Manufacturers Association of Connecticut and the other by the president of Yale university.

Ninety-one mechanical stokers aggregating 66,492 horsepower were sold during January, according to statistics compiled by the department of commerce, Washington. This was the highest since last September when 99 totaling 60,486 horsepower were sold.

Classifies Castings To Figure Costs

SETTING correct prices for castings for the average jobbing foundry is a complicated task. The foundry without a strict cost system must rely on the judgment of the cost clerk, a practice which often is little better than guess work. Even where costs have been determined accurately it is difficult for the salesman to estimate on a job from figures based on the cost of certain castings. To assist him a number of foundries have devised classification sheets by which the salesman can classify the casting to be made from it and rules laid down by the cost department can determine closely the proper selling price for the castings.

One of these classification sheets used by the Ideal Bronze Co., Cleveland, is shown in the accompanying illustration. The first classification is castings from standard gates for which not more than 50 molds are required on an order. These are divided according to whether the castings require cores or not. Then the price per pound is quoted according to the metal of which the casting is to be made. By a standard gate is meant one which produces at least 3 and up to 3½ pounds of castings per mold, in a certain sized flask.

Gates producing less weight of castings than a standard gate are divided into seven classes according to the weight of metal in the castings on a gate. Gates heavier than the standard gate are divided into five classifications. The smaller gates include those which produce as little as 1 pound of castings to a gate, and the heavier gates produce as high as 7 pounds of castings. Below the lower figure and above the higher figure each job must be estimated specially. Percentages are given for deductions in case an aluminum match plate is furnished instead of an open gate; also when over 50 up to 100; over 100 up to 250; over 250 up to 500; and over 500 molds are ordered made at one time.

A somewhat similar classification is made for castings from standard single loose patterns. However, in this case no classification is made according to the number of molds required on an order. The weight of the casting from a standard loose pattern is limited to not less than 5 and up to 6 pounds. Castings weighing less than the allowance for castings from a standard loose pattern are graded into six classes extending to castings weighing 1 pound each.

Castings weighing more than 6 pounds are divided into three classes, covering castings from 6 to 9 pounds in weight. These classifications like those of castings from standard gates also are subdivided into castings requiring and those which do not require cores.

The estimate sheet was prepared by E. V. Coulston, proprietor of the Ideal Bronze Co.

Ideal Standardized Casting Prices

Confidential Quotation No._____ Cleveland, O._____ 192____

_____

_____

Gentlemen:

We propose to make castings on your orders, as follows.

Castings from Standard Gates	Red Brass Per Lb.	St'd'rd Bronze Per Lb.	Gun Metal Per Lb.	St'd'rd Alum. Per Lb.		
Base Price, no cores, run of 50 molds or less						
Base Price with cores, run of 50 molds or less						

A Standard Gate is one producing at least 3 lbs. and up to 3½ lbs. of casting per mold, requiring not larger than a 12"x15"x3" two piece snap flask. Work that is larger or that requires unusual work in molding or finishing will be individually figured for each specific case.

Gates Lighter Than Standard	No Core	With Core
Producing per mold:		
Not under 2½ up to 3 lbs., add to Base Price		c. lb.
" " 2¼ " " 2½ " " " " "		c. lb.
" " 2 " " 2¼ " " " " "		c. lb.
" " 1¾ " " 2 " " " " "		c. lb.
" " 1½ " " 1¾ " " " " "		c. lb.
" " 1¼ " " 1½ " " " " "		c. lb.
" " 1 " " 1¼ " " " " "		c. lb.

Anything lighter to be specially figured

Gates Heavier Than Standard	No Core	With Core
Producing per mold:		
Not under 3½ up to 4 lbs., deduct from Base Pr.		c. lb.
" " 4 " " 4½ " " " " "		c. lb.
" " 4½ " " 5 " " " " "		c. lb.
" " 5 " " 6 " " " " "		c. lb.
" " 6 " " 7 " " " " "		c. lb.

Anything heavier to be specially figured.

	Brass & Bronze	Aluminum
If Aluminum Match Plate is furnished instead of Open Gate, deduct	5%	3%
If over 50, up to 100 Molds ordered made at one time, deduct	5%	3%
If over 100, up to 250 Molds ordered made at one time, deduct	6%	4%
If over 250, up to 500 Molds ordered made at one time, deduct	7%	5%
If over 500 Molds ordered made at one time, deduct	8%	6%

Castings from Standard Single Loose Patterns	Red Brass	St'd'rd Bronze	Gun Metal	St'd'rd Alum.		
Base Price, no cores						
Base Price, with cores						

A Standard Single Loose Pattern is one producing not less than 5 and up to 6 lbs. of casting to the pattern.

Loose Patterns Lighter Than Standard	No Core	With Core
Producing per pattern:		
Not under 4 up to 5 lbs., add to Base Price		c. lb.
" " 3 " " 4 " " " " "		c. lb.
" " 2½ " " 3 " " " " "		c. lb.
" " 2 " " 2½ " " " " "		c. lb.
" " 1½ " " 2 " " " " "		c. lb.
" " 1 " " 1½ " " " " "		c. lb.

Loose Patterns Heavier Than Standard	No Core	With Core
Producing per pattern:		
Not under 6 up to 7 lbs., deduct from Base Pr.		c. lb.
" " 7 " " 8 " " " " "		c. lb.
" " 8 " " 9 " " " " "		c. lb.

Anything heavier or lighter to be specially figured. Patterns requiring intricate molding to be specially figured.

If specific price is desired on any special casting, send samples with advice as to size and makeup of gate, or send gate from which we will make trial mold, and we will state exact price.

This quotation for reasonably prompt acceptance and is not binding on us until you send us written acceptance.

After such acceptance it will be binding on us for _____ days for such specified orders as you send us in that period. After such period we may change the prices to conform to market changes in the prices of copper, tin, aluminum or labor, but no such change will go into effect until we have sent you a new written quotation.

No responsibility attaches to us for delays caused by strikes, fires, public calamities or similar causes beyond our control.

Respectfully submitted,

THE IDEAL BRONZE CO.

Per_____

MANY FACTORS ENTER INTO THE PRICE OF A CASTING AND THESE ARE BETTER ESTIMATED WHEN PROPERLY CLASSIFIED

Mellon's Plan Praised at Steel Club Banquet

Philadelphia, March 18.—At the annual dinner of the Steel Club of Philadelphia in this city last week, Andrew W. Mellon was extolled as the greatest secretary of the treasury since Alexander Hamilton. W. Warren Giles, the principal speaker, said the Mellon tax plan is right and desirable from the standpoint of the general welfare of all classes, and it can be enacted if there is enough popular support for it. Mr. Giles deplored the tendency to pass radical legislation and blamed this tendency on the general lack of interest in what is done in Washington. He cited figures to show that in more than half of the states not more than 20 per cent of the voters have gone to the polls in recent elections. It is fortunate for these citizens, he said, that the framers of the constitution made it impossible for legislators to infringe on any of the seven inalienable rights of the American people. Mr. Giles pointed out that many countries now are ruled by dictators, and that even Great Britain has no constitution to insure a continuance of democratic government. He alluded to the great achievements of Henry Ford as being possible of accomplishment only in the United States, and said the opportunities for business success today are greater than ever before. Our greatest danger lies in the activities of radical politicians at Washington, and he urged that the individuals as voters should exert their best efforts to elect the right men and thus stem the tide of radicalism.

Major Charles D. Morris, correspondent in the Near East for various newspapers spoke about America's possibilities in foreign business fields. He said there is much opportunity for development in the Near East. F. B. Snyder summarized the results of the Steel club's golf tournaments during the past year. Those present included representatives of all steel companies soliciting business in the Philadelphia territory, who had as their guests the purchasing agents of most of the important steel buyers in the district. H. G. Uphouse, president of the club, presided.

Plan Trade Conference

Another Cleveland foreign trade conference is announced by the chamber of commerce of that city for Tuesday, April 8. The success of the conference last December, which was devoted to Japanese trade, has led to plans for a similar meeting with respect to India. Experts from the bureau of foreign and domestic commerce, Washington, will present information. Among them will be Percy Owen, former president and general manager of the Liberty Motor Co., now chief of the automotive division. E. S. Gregg, transportation division, will give an illustrated talk on packing for shipment to the Far East. A number of additional features are to be announced later.

Uniform Cost Accounting Topic of Conference

Washington, March 18.—A national conference on the development of uniform cost accounting, organized by the fabricated production department of the chamber of commerce of the United States, will be held at the Hotel Astor, New York City, March 25 and 26. Representatives of many of the 300 principal manufacturing industries of the country will constitute the personnel of the conference. There will be a large attendance of trade association executives, members of cost committees and others interested in the prosecution of cost accounting activities.

Societies News

AT THE annual meeting of the American Railway Engineering association at Chicago last week the committee on rails submitted a design for a 150-pound steel rail. On account of the greatly increased wheel loads and density of traffic, much interest has been shown in the design of a heavier rail and a possible increase in the standard length. The committee, however, was not prepared to recommend a definite rail length in excess of the present 33-foot standard. A comprehensive list of revisions in the specifications for steel for railway bridges was submitted for adoption. A report on the application of electric welding to steel bridge fabrication indicated that welding as applied to structural steel still is in an experimental stage.

* * *

Plan International Congress

American engineering societies will unite with the Czechoslovak Society of Engineers and Architects in an international congress under the auspices of the government of Czechoslovakia to be held in Prague in July, according to an announcement just made by the American Engineering council. The congress will follow the world power conference to be held in London.

* * *

To Hold Safety oCnference

A comprehensive safety conference is to be held in Cleveland May 16 under the auspices of the engineering section of the National Safety council, the Society of Ohio Safety Engineers and the Cleveland Engineering society. The general topics to be discussed are "Safety Legislation and Codes" and "Plant Housekeeping." Among the speakers will be J. W. Patterson, Hydraulic Pressed Steel Co., Cleveland; Dr. H. C. Davis; J. M. Woltz, Youngstown Sheet & Tube Co., Youngstown, O.; F. C. Allen, New York; and Frank A. Scott, Warner & Swasey Co., Cleveland.

Convention Calendar

April 1-3—American Association of Oil Burner Manufacturers. First annual meeting, Hotel Chase, St. Louis. Leod D. Becker, 518 Bank of Galesburg building, Galesburg, Ill., is secretary.

April 2-3—Association of Iron and Steel Electrical Engineers, combustion engineering section, William Penn hotel, Pittsburgh. John F. Kelly, 513 Empire building, Pittsburgh, is secretary.

April 23-24—National Metal Trades association. Annual convention at the Hotel Astor, New York. Louis W. Fischer, Peoples Gas building, Chicago, is secretary.

April 24-26—American Electrochemical society. Spring meeting, Bellevue-Stratford hotel, Philadelphia, Dr. Collin G. Fink, Columbia university, New York, is secretary.

April 28-30—American Gear Manufacturers' association. Spring meeting, Lafayette hotel, Buffalo. T. W. Owen, 2443 Prospect avenue, Cleveland, is secretary.

April 30-May 2—Society of Industrial Engineers—Annual convention at Buffalo. George C. Dent, 608 South Dearborn street, Chicago, is secretary.

May 5-10—Sheet Steel Executives. Second annual convention under auspices of National Association of Sheet and Tin Plate Manufacturers, Hotel Greenbrier, White Sulphur Springs, W. Va. W. S. Horner, 1832 Oliver building, Pittsburgh, is chairman.

May 8-9—British Iron and Steel institute. Annual meeting at the Institution of Civil Engineers, London. G. C. Lloyd, 28 Victoria street, London, is secretary.

May 19-21—Southern Supply and Machinery Dealers' association, National Supply and Machinery Dealers' association, and American Supply and Machinery Manufacturers' association—Triple convention at Hotel Cleveland, Cleveland. Alvin M. Smith, Smith-Courtney Co., Richmond, Va.; T. James Fernley, 505 Arch street, Philadelphia; and F. D. Mitchell, 1819 Broadway, New York, are the secretaries respectively.

May 20-23—National Association of Purchasing Agents. Annual convention, Mechanics Hall, Boston. W. L. Chandler, 19 Park place, New York, is secretary.

May 22-23—American Society for Steel Treating. Spring sectional meeting, LeClaire hotel, Moline, Ill. W. H. Eisenman, 4600 Prospect avenue, Cleveland, is secretary.

May 22-23—National Pipe and Supply association. Annual meeting, Hotel Cleveland. George L. McIlvane, 909 Oliver building, Pittsburgh, is secretary.

May 26-29—American Society of Mechanical Engineers—Spring meeting Hotel Cleveland, Cleveland. Calvin W. Rice, 29 West Thirty-ninth street, New York, is secretary.

Here and There in Industry

Live Information Which Records the Expansion of Various Lines of Productive Enterprise

REORGANIZATION of the Bock Bearings Co., Toledo, O., was effected recently, with Maynard H. Murch, Cleveland, being elected president. Robert E. Clinghan, vice president and general manager will continue as the operating head of the company while C. O. Steinbicker was elected secretary and treasurer. The directorate was increased to nine members through the election of the following: W. E. Bock, president of the Erie Glass Co. and the Bock Laundry Machine Co., Toledo; W. S. Quinlan, president of the Chicago Nut Mfg. Co.; W. G. Mather, president of the Cleveland-Cliffs Iron Co., Cleveland; F. F. Prentiss, vice president, Cleveland Twist Drill Co., Cleveland; John A. Kling, chairman of the Kelly Island Lime & Transport Co. and president of Cleveland Builders Supply & Brick Co., Cleveland; George E. Randles, president, Foote Burt Co., Cleveland; R. B. Wallace, Kinney Steamship Co., Cleveland, and Mr. Murch and Mr. Clingan. Mr Clingan, Mr. Randles and Mr. Quinlan were appointed as an executive committee.

* * *

CONTRACT for 4000 patent steel freight car doors was received by the Youngstown Steel Car Co. recently. The work which will involve an expenditure of about $400,000 will take a large tonnage of light plates. Operations on this contract have been started in the plant at Niles, O.

* * *

FREYN, BRASSERT & CO., Chicago, recently has received contracts for a gas washer for No. 1 blast furnace of the Inland Steel Co. at Indiana Harbor, Ind., and for a similar washer for No. 4 furnace of the Republic Iron & Steel Co. at its Hazelton plant.

* * *

A NEW building for its Detroit branch recently was completed by the American Bosch Magneto Corp., Springfield, Mass., manufacturer of electrical devices for the automotive industries. The new plant is located at 89-95 Hancock avenue west, between Woodward and Cass avenues. Sales, service and repair divisions, together with the general offices for that district will be housed in the new plant. The Detroit district includes Michigan, Ohio, parts of Indiana, West Virginia and Kentucky.

* * *

THE Massillon Bar Joist Co. recently was incorporated in Delaware to distribute the products manufactured by the Massillon Steel Joist Co., Massillon, O. The sales organization will handle distribution in Missouri, Kansas, Oklahoma and Arkansas. The main offices of the new corporation are at St. Louis.

* * *

H. O. SWOBODA, INC., Empire building, Pittsburgh, consulting electrical and mechanical engineer, has been retained by Hubbard & Co. that city, manufacturer of shovels and electrical materials, to prepare plans and specifications for a new substation to be installed by the Duquesne Light Co. Contracts will be let for the work as soon as specifications and plans are completed.

* * *

THE Electric Furnace Construction Co., 1015 Chestnut street, Philadelphia, recently has placed in operation a new type of electrically heated continuous vitreous enameling furnace for the Armstrong Mfg. Co., Huntington, W. Va. The company also has been awarded a contract for two large vitreous enameling furnaces for the Buckwalter Stove Co., Royersford, Pa.

* * *

HELLER-ALLER CO., Napoleon, O., increased its plant capacity recently to accommodate an enlarged business. The company manufactures windmills and steel tanks and recently has brought out improvements which have increased the demand for its products. The Heller company operates a foundry where all castings that are used by the company are made. Six new pumps have been invented upon which production is expected to begin shortly.

* * *

REORGANIZATION of American Grinder Mfg. Co., Milwaukee, has provided more working capital for production of automobile wrenches, mechanics' tools and tool grinders, as well as assuring finances for future expansion. E. J. Archambault has retired as president and is succeeded by Herbert P. Brumder. The personnel under the new plan will remain practically the same. The company markets its entire output through the C. M. & F. W. Jonas Co., Chicago, with a branch at Los Angeles.

* * *

ADDITIONS are being made to the entire plant of Wolff Mfg. Corp., Chicago, manufacturer of plumbing fixtures and equipment. Contracts have been signed for a new fireproof, cement and steel building, 200 x 250 feet, for enameling cast iron sanitary ware. Equipment needs include the addition of 12 new enamel furnaces, to consolidate all of the brass industry in one large 5-story building and altogether the company plans to double the past output for which purpose an expenditure of more than $500,000 is planned. J. A. Leffert is vice president of the Wolff corporation.

* * *

ARTHUR B. SHEPARD CO. is moving its offices from 6007 Euclid avenue, Cleveland to Irvington, N. J., a suburb of Newark. It has taken a 2½-acre site in New Jersey along the Lehigh Valley railroad where it will build a plant, the first unit of which will be 50 x 200 feet. This is to be extended to 400 feet in length to provide office and storage buildings. The buildings will be fabricated at the Cleveland plant and will be shipped to Irvington. The company manufactures structural steel buildings and gasoline filling stations. Better shipping facilities by water routes is given as one cause of the change in location.

* * *

CONTRACTS have been awarded for a new plant at Seventy-fourth and Loomis streets, Chicago, for the Dreis & Krump Mfg. Co. that city, manufacturer of steel bending brakes, sheet metal working machinery, etc. The main plant will be 100 x 230 feet. The center of the building is 1-story in height and will be served by a 10-ton crane which has been ordered from Whiting Corp. The side bays contain two floors. A 2-story, 30 x 60-foot addition will be used for garage and office. The structural contract for erecting the plant has been let to New City Iron Works, Chicago. The Dries

company expects to occupy the new plant about June 1. The building will be about twice the size of the present plant, and will be used for manufacture of angle benders, bending brakes, slitting shears and overhead track.

* * *

RECENT meeting of the stockholders of the California Wire Co., Orange, Cal., resulted in the re-election of Louis Koth, president; Fred W. Struck, vice president; Fred A. Grote, secretary and treasurer; W. C. Matthias and William Klug, directors. Additional equipment recently was installed to provide for increased capacity. The new unit is to raise the daily output from 40 to 50 tons of wire.

* * *

CAPACITY of the General Machinery Co. plant at 3500 Riverside, Spokane, Wash., has been doubled by the recent completion of a 2-story, 50 x 120-foot building. Improvements including machinery, cost about $22,000. The General Machinery Co. manufactures rock screens, elevators, centrifugal pumps, drag line hoists, sawmill machinery and mining and road building equipment. E. J. Simons is president and G. C. Sutton, vice president.

* * *

ORNAMENTAL and miscellaneous iron will be fabricated by the Builders Iron Work Co., 1401 South Second street, St. Louis, recently incorporated for $18,000. The company will not build a plant. All equipment to meet present needs has been purchased and much of it is being installed. Venner S. Sappenfield is president of the company, Victor S. Sappenfield, vice president, and F. W. Fotsch, secretary and treasurer.

* * *

A NEW cleaning and storage building for the Ferro Machine & Foundry Co., at the East Sixty-sixth street and Hubbard avenue plant, Cleveland, recently was completed. The building, costing about $45,000 will provide approximately 30,000 square feet of additional floor space and will be used for cleaning gray iron castings and storage. Equipment has been installed and production begun. The plant addition was erected by the H. K. Ferguson Co., Cleveland, engineer and contractor.

* * *

HEYL & PATTERSON, INC., Pittsburgh, and New York, has been awarded the contract for a complete coal handling plant for the Ohio River Edison Co. now under construction at Toronto, O. Stevens & Wood, Inc., New York, is engineer and contractor for the project. Equipment involved includes unloading towers with 4-ton buckets, conveyor belts, crushers, screening equipment, railroad hoppers, etc., and a tower and cableway system to provide for handling coal to and from a storage pile.

* * *

STRUCTURAL steel fabricating now is being done by the Johnson Wire & Iron Works, High Point, N. C., manufacturer of crimped and woven wire work and ornamental iron work. The company specializes in ornamental iron fabrication. It occupies a shop building 40 x 160 feet, in which it intends to install plate bending rolls for tank and stack work. The machine will be of ¼-inch capacity, five feet between housings, pyramid type, drop end housing. G. S. Johnson is general manager.

* * *

INCORPORATION of the Globe Stamping Co., successor to J. H. Messner, 232 Albert street south, Kitchener, Ont., was effected recently. The company was formed to enlarge the plant which was built last year but which was not large enough to meet present requirements. The company is capitalized at $100,000. J. Messner is president and A. V. Armbrust, secretary and treasurer. The company manufactures trunk hardware, automobile window regulators, hinges, door catches and other hardware.

* * *

A FOUNDRY building, 100 x 400 feet, is being planned by the Ward Railway Equipment Co., Lima, O., recently incorporated for $50,000. The building is to be equipped as a modern gray iron foundry. The company intends to specialize in the manufacture of safety and time saving appliances for railroads, in addition to doing a general railroad foundry business. Manfacture of several patent products, including a re-railer, air release appliance, push pole, etc., also will be started as soon as equipment is installed. Joseph T. Ward, is president, George T. Shambow, vice president; Edward P. Kiely, treasurer, and Oscar G. Snyder, secretary. The foundry work will be under supervision of James Rountree, for 14 years foundry superintendent of the American Locomotive Works.

* * *

ORGANIZATION of the Means Stamping Co., Saginaw, Mich., has been completed and the following officers elected: Ralph P. Means, president and general manager; Frank A. Picard, vice president; J. George O'Brien, secretary and Charles Q. Carlisle, treasurer. A building has been leased on Rust avenue from Wylie & Wilson, Inc., and part of the equipment and machinery has been installed. The company intends to conduct a job shop for the manufacture of light stampings and metal specialties, principally for the automotive industry. Mr. Means, president of the company, has been connected with the stamping industry for 15 years, being associated at various times with the Crosby Co., Buffalo; Benjamin Electric Mfg. Co., Chicago; Carde Stamping & Tool Co., Saginaw, Mich., and the Metal Goods Corp., Buffalo.

* * *

CAPITAL stock of the Lakeside Bridge & Steel Co., North Milwaukee, Wis., engineer, contractor, manufacturer of steel frame structures and builder of machinery, recently was increased from $150,000 to $500,000. The company has shown steady growth since its incorporation in 1913. It now has an annual capacity of 10,000 tons of fabricated material in addition to its material handling equipment. V. W. Coddington is president, S. C. Coddington, treasurer and general manager, C. G. Margwarth, vice president and assistant manager, H. M. Risseeuw, vice president and general sales manager, F. J. Hammer, vice president, W. H. Genske, secretary and assistant treasurer. The first three named officers are directors.

* * *

OPERATION has begun in two new steel plants in Los Angeles, representing an expenditure for construction of approximately $1,500,000. The Emsco Press Forging Co. at Boyle and Slauson avenues and the Emsco Tool Co. adjoining the Emsco Steel Products Co., Alameda street near Florence avenue, have been completed, equipment installed, and production begun. Both plants are headed by E. M. Smith, president of E. M. Smith Co. and many other Los Angeles companies.

The Emsco Press company will produce steel forgings, pressed steel, tool joints and billets. Electric furnaces are used in this plant, the first of their kind to be installed in the West. G. E. Moreland, president of the Western Drop Forge Co. is vice president and general manager of the Emsco Press Forging Co. Union Iron Works designed and erected the plant which is 75 x 300 feet, of structural steel, with galvanized iron sides and roof. The Union Iron Works also designed the plant for the Emsco Tool Co. which has a 100 x 300-foot main building and a 40 x 300-foot structure for the chain department and heat treating building. The company will manufacture oil well drilling machinery. E. W. Goeser, former chief engineer of the Union Tool & National Supply Co., Toledo, O., is vice president and general manager.

Men of Industry

Personal News of a Business Character Pertaining to the Iron and Steel and Related Fields of Enterprise

HORACE W. GILLETT, of Detroit, metallurgist and electrochemist, and formerly research manager of the Detroit plant of the Aluminum Castings Co., has been appointed chief of the metallurgical division of the bureau of standards, effective March 1, to fill the post made vacant by the appointment of Dr. George K. Burgess, as director of the bureau of standards. Mr. Gillett comes to the metallurgical division from the bureau of mines, department of the interior, where he was chief alloy chemist.

Dr. Gillett holds A.B. and Ph.D. degrees from Cornell university. He is known widely in metallurgical fields as having developed the rocking electric brass melting furnace. He also has been associated with the Thomas A. Edison laboratories at West Orange, N. J., and with A. D. Little, Inc., of Boston. He has written a number of metallurgical and chemical works, including "Temperature Measurements in an Experimental Carborundum Furnace," "Brass Furnace Practice in the United States," "Melting Aluminum Chips" and "Melting Brass in a Rocking Electric Furnace." He also has written articles for various scientific journals.

During the war, Dr. Gillett was engaged in co-operative metallurgical and electrical furnace work on problems for the war industries board. He is a member of American Chemical society, the American Electrochemical society, the British Institute of Metals and other organizations. H. S. Rawdon, of the bureau of mines, has been acting chief of the metallurgical division.

* * *

Frederick E. Wright has joined the sales department of the International Oxygen Co., Newark, N. J.

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S. M. Tomlinson of Frank Samuel & Co., Philadelphia, is in Brazil for a stay of a few weeks.

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W. L. Goodrich and W. H. Rieger have been appointed special representatives at Pittsburgh of the Colonial Steel Co., that city.

* * *

R. M. Nicholson, who recently joined the Union Metal Mfg. Co., Canton, O., was for nine years advertising manager of the United Alloy Steel Corp., that city.

* * *

L. E. Deeley, for seven years manager of the credit department of Boyer-Campbell Co., Detroit, distributor of machinery and tools, has become manager of the adjustment bureau of the Detroit Association of Credit Men.

DR. HORACE W. GILLETT

* * *

H. D. Smith recently has been appointed as a representative of the Colonial Steel Co., Pittsburgh, in the western half of Connecticut. Mr. Smith assumed his new duties on March 3. W. H. Duley is district manager in that territory.

* * *

Paul F. Hermann, former manager of *Stahl und Eisen*, German technical publication, has engaged in business at 501 Century building, Pittsburgh, as a representative of German publishing companies and scientific societies.

* * *

F. E. Clark, who recently became sales engineer of the Republic Carbon Co., Inc., Milwaukee, manufacturer of carbon electrodes with works at Niagara Falls, N. Y., formerly was connected with the New York offices of the United States Steel Corp.

* * *

William G. Clyde, vice president and general manager of sales of the Carnegie Steel Co., Pittsburgh, has been appointed to have general supervision of all warehouses. In these added duties he succeeds the late E. A. Amaden.

* * *

Ambrose G. Warren, recently connected with the Aetna Foundry Co., Philadelphia as vice president and treasurer, formerly was chief engineer and general superintendent of the J. W. Paxson Co., that city, manufacturer of foundry supplies and equipment. He also is vice president of the Pennsylvania Bronze & Brass Co., Philadelphia. Mr. Warren will devote part of his time to consulting engineering, specializing in the design and operation of iron and brass foundries.

* * *

W. B. Jameson, who recently became connected with the Hydraulic Steel Co., Cleveland, in charge of all plant operations in the east side plant, formerly was superintendent of the plant at Newcastle, Ind., of the Maxwell Motor Co. More recently Mr. Jameson was general superintendent of the Earl Motors Mfg. Co., Jackson, Mich. He has been identified with the manufacturing of machine parts, automobile manufacturing and the steel industry for 20 years.

Harry Kranz is in charge of all plant operations of the Hydraulic Steel Co. in its west side plant.

* * *

Thomas Vickers has resigned as secretary of the British Cast Iron Research association which he has been since 1919. Mr. Vickers has been prominent in the British foundry industry for many years. In addition to having been one of the prominent factors in the organization of the Cast Iron Research association, he was secretary of the Birmingham Metallurgical society for some time. He now is a member of the council of the Institute of British Foundrymen. He was the principal organizer of the first foundry equipment exhibition which was held in Birmingham, 1922.

Obituaries

PHILO NELSON FRENCH, aged 64, Pittsburgh steel manufacturer, died March 15 at Hot Springs, Ark. About 25 years ago Mr. French was stricken with paralysis and retired from active participation in the affairs of the Railway Steel Spring Co. Since that time he has been spending his winters in Arkansas. Mr. French was the son of the late Aaron French, organizer and founder of the A. French Spring Co., which later was merged with the Railway Steel Spring Co. He was educated at Greylock institute and Lehigh university and began his business career with Mackintosh, Hemphill & Co., working in the drawing and designing department.

* * *

Francis C. Arnold, superintendent of the American Sheet & Tin Plate Co. mills at Canton, O., died in that city March 14 at the age of 49 years.

* * *

Frank Chew, for many years editor of the *Metal Worker, Plumber & Steamfitter*, died March 8 at his home in Summit, N. J., aged 67.

* * *

LeRoy Beardsley, for 20 years treasurer of the Chicago Pneumatic Tool Co., Chicago, died March 5 at his home in Riverside, Ill., at the age of 72 years. Mr. Beardsley belongs to the South Shore country and Union League clubs, Chicago.

* * *

Robert H. York, president of the Berkshire Mfg. Co., manufacturer of molding machines, a director of the Sterling-Knight Mfg. Co. and identified with several other interests in Cleveland, died at his home in that city March 16 at the age of 60 years.

* * *

Alfred George Ballard, former superintendent of the Solvay Process Co., Detroit and father of James N. Ballard, general sales manager of the Semet-Solvay Co., died March 10, at his residence in that city. Mr. Ballard retired from the Solvay Process Co., in 1921 because of ill health.

* * *

John Kirby, vice president and general superintendent of the Wm. B. Pollock Co., Youngstown, O., blast furnace builder and maker of stack supplies, who retired only two months ago after more than 50 years service with that company died March 14 at the age of 68. Mr. Kirby was born in Toronto, Ont. As a boy he entered the service of the Pollock company and rose to the highest operating position.

* * *

John M. Mack, inventor of an automobile truck, and founder of the Mack Motor Car Co. now the International Motor Co., New York, was killed March 14 when his automobile collided with a work car of the Lehigh Valley Transit Co. near Allentown, Pa. Mr. Mack was president and general manager of the Mack Motor Car Co. until its purchase and subsequent organization as the International Motor Co. He then organized and was president of the Macca Truck Co., Scranton, Pa.

* * *

John F. Alvord, president of the Torrington Co., Torrington, Conn., manufacturer of needles, died suddenly, March 13, at his home in New York. Mr. Alvord was a son of Charles Alvord who in 1865 founded the Excelsior Needle Co., which later became the Torrington Co. He joined his father's business in the eighties and developed it greatly. Mr. Alvord was president of the Progressive Mfg. Co., the Splitdorf Electric Co., and was a director of the Wire Wheel Corp. of America and the Union Hardware Co.

* * *

Albert Hirshheimer, aged 84, founder and president of the LaCrosse Plow Co., LaCrosse, Wis., one of the largest plants of the kind in the world, died March 11. He was born in Germany and came to America in 1850, beginning the manufacture of plows in 1865. For some years the direction of the business has been in charge of his son, Harry J. Hirshheimer, vice president and general manager. Another son, Louis C. Hirshheimer is secretary and treasurer. Albert Hirshheimer founded the Batavian National bank at LaCross, the LaCrosse Rubber Mills, and other enterprises.

* * *

Robert E. Mace, purchasing agent for the Oliver Iron Mining Co., died March 5 at the age of 72 years. He had been purchasing agent of the Oliver company since the formation of the United States Steel Corp. in 1901. Mr. Mace was born near Montreal, Que., and came to the United States in 1883 becoming associated in a clerical capacity with the Marinette Iron Works, Marinette, Wis. In 1899 he joined the Oliver Co. as purchasing agent with headquarters in Milwaukee, and in 1901 was transferred to Duluth as purchasing agent for the Oliver Iron Mining Co. which position he held until his death.

* * *

Frederick C. Fladd, who died a short time ago was known widely as a consulting engineer, having served for over 33 years in that profession. He was born in Glastonbury, Conn., on Dec. 7, 1855 and served his apprenticeship as machinist with the Stiles & Parker Press Co., Middleton, Conn. He worked upward through the various positions in that plant, becoming superintendent. When the company was merged with the E. W. Bliss Co. in 1890, Mr. Fladd joined the latter organization as traveling engineer, a position which he held until August, 1923. Mr. Fladd was a member of the American Society of Mechanical Engineers and the New York Flue club.

* * *

Napoleon B. Merritt, a pioneer of the iron ore industry in the Lake Superior district, died March 12 at the age of 90 years at his home in Duluth. Establishing his residence in Duluth in 1855, he soon became identified with the iron ore mining industry. He was an incorporator of the Duluth, Missabe & Northern railroad and a director of the Lake Superior Consolidated Iron Mines Corp. Together with his brothers, Leonidas Merritt, finance commissioner of Duluth, and Alfred Merritt, also of Duluth, he operated iron ore mines which later were acquired by other interests and absorbed by the Oliver Iron Mining Co. At the present time the Merritt brothers are operating iron ore mines on the Cuyuna range.

Continental Can Net Up

The Continental Can Co. reports net earnings of $4,837,480 for 1923, against $4,438,508 in the previous year. After providing for taxes, interest and other charges, there was net income of $3,767,730, against $3,161,603 in 1922. After payment of dividends there was a surplus of $2,360,692 in 1923, and the profit and loss surplus on Dec. 31, 1923, was reported as $5,182,522.

The balance sheet showed inventories of $7,132,632, against $4,929,387; accounts and bills receivable, $1,795,936, against $1,831,833, and cash holdings of $1,881,496, against $2,314,833. Accounts and notes payable totaled $799,195.

Implement Makers Deny Conspiracy Charge

Washington, March 18.—Answers have been filed by several corporations engaged in manufacturing farm implements to the recent complaint of the federal trade commission charging a number of firms and trade associations with conspiracy to interfere with the purchase of farm equipment and machinery on a co-operative basis by farmers' co-operative associations, and also conspiracy to fix and maintain prices. A number of associations of retail dealers also were named in the complaint, together with their parent association, the Eastern Farm Federation, Farm Machinery Dealers, and Grant Wright, president and editor of *The Eastern Dealer*, an implement dealers' publication.

The International Harvester Co. says the allegations of the trade commission have no relevancy to the company and the company never has sold farm implements to all members of the respondent associations, but to some of the members and to many who are not members. The company denies any part in an alleged conspiracy to fix and maintain prices or to cut off the supply of farm implements and parts to any jobbers or farmers' co-operative associations and also to any who are not defined by the associations, clubs and other manufacturers mentioned in the complaint as regular dealers.

The harvester company also denies it has contributed funds to maintain any policy of discrimination such as charged in the complaint, but states that in 1916, 1917 and 1918 it made three contributions of $75 each to Grant Wright to extend the work of dealer organizations and to preserve the friendly feeling among members of the trade associations, many of whom were the company's customers.

The Oliver Chilled Plow Works denies the charges and states that no changes in dealers have been made because of their making certain prices to customers. The company says it has contributed to dealers' associations only in isolated cases.

The Moline Plow Co., Inc., denies the allegations and says it sells its products to any dealer or co-operative association having proper financial resources and capable of rendering the service to farmers which it requires of its representatives. The company states that its merchandising policy has been to reduce the price of agricultural implements and supply parts to farmers, dealers and co-operative associations.

Waldo, Egbert & McClain, Buffalo, N. Y., dealer in pig iron, coke, coal, alloys and steel, has increased its capital stock from 1000 to 5000 shares of preferred stock, $100 par value, and from 3300 to 10,000 shares common stock no par value.

Bethlehem Building 300 Homes at Lackawanna

A model community for its employes, to cost approximately $1,250,000, is under construction by the Bethlehem Steel Co., at its plant in Lackawanna, N. Y. Bethlehem Park covers 63 acres adjacent to the company's Lackawanna plant, and contains 300 houses, all of which will be sold to employes. The development will be completed by the end of the year. Some of the houses are already occupied.

Under the selling terms of the Bethlehem Land & Improvement Corp. a subsidiary of the Bethlehem Steel Corp., the purchaser is assured a home well under the prevailing costs of similar houses elsewhere, the saving running in some cases as high as 20 per cent. The prices range from $3600 to $4500, of which 10 per cent constitutes the initial payment. Monthly payments range from $30 to $40. A life insurance provision is attached to the selling plan which protects the company and the family of the employe in case of death.

The company retains no rights of any kind in the houses or land as long as the mortgage and other obligations are met.

Railroad Raises Wages

An agreement covering new rates of pay has been made by the Pennsylvania Railroad Co. with its employes. The increase is approximately 5 per cent over the present scale for engineers, firemen, hostlers and hostlers' helpers. The specific increase over the present basic daily rates are: Passenger service 24 cents a day; freight 36 cents; yard 32 cents; hostlers and hostlers' helpers 32 cents. The new rates date from Jan. 16, 1924 and affect 22,000 employes.

Illinois Employment Gains

Chicago, March 18.—Industrial employment in Illinois in February was the greatest since May, 1923, according to the Illinois department of labor. February employment was 2.2 per cent greater than January. The average weekly earning in February was $28.36, compared with $25.67 in January. The February figure was the highest since July, 1922. In the iron and steel industry the February gain over January was 6.2 per cent, or nearly three times the average increase.

Consumers Declare Where They Buy Steel

New York, March 18.—In further hearings of the federal trade commission's suit for dissolution of the Bethlehem Steel Co.'s acquisition of the Lackawanna Steel Co. and the Midvale Steel & Ordnance Co., H. C. Frey, general purchasing agent, General Railway Signal Co., Rochester, N. Y., said his company buys about 2400 tons of plates shapes and bars a year, mostly from Carnegie Steel Co., with which he generally has a contract, 3600 tons of pig iron a year, usually from M. A. Hanna & Co. and the Donner Steel Co.

Charles A. Becker, assistant to vice president, Merchants Despatch Transportation Co., East Rochester, N. Y., said he buys about 15,000 tons of plates, shapes, bars, wheels and axles a year. About 85 per cent of the company's output is refrigerator cars, and about 90 per cent of its work is done for the New York Central railroad. Before Bethlehem took over Lackawanna in October, 1922, he bought 90 per cent of his plates, shapes and bars from Jones & Laughlin and Lackawanna. Since then he testified in answer to questions he has been buying the Lackawanna share from Bethlehem.

A. D. Morris, eastern sales manager American Bolt Corp., was questioned about his purchases when he was assistant secretary of the Bayonne Bolt & Nut Co. He bought about 8000 tons of bars and 1500 tons of wire a year. The bars were obtained from Lackawanna, Jones & Laughlin, Youngstown and Carnegie. After the acquisition, the company obtained from Bethlehem the bars it formerly had obtained from Lackawanna.

James Plummer, purchasing agent, Newport News Shipbuilding & Dry Dock Co., said the average purchases of his company are 30,000 tons of plates, shapes and bars a year. He has been getting 98 per cent of his bars and shapes from Carnegie, 50 per cent of his plates from Carnegie, and 45 per cent from Lukens and Central Iron & Steel Co. He said he never was solicited by Lackawanna but is being solicited by Bethlehem. He said he buys forgings, bolts and nuts and tool steel from Bethlehem.

A. G. Heller, Heller Bros., Newark, N. J., manufacturer of files, said he purchases about 6000 tons of billets a year and 700 tons of high carbon and file steel bars. The company is equipped to roll the billets into bars. He has been buying billets from Alan Wood and Bethlehem. The bulk of the file steel bars have been obtained from Carnegie and Bethlehem. He said he never was solicited by Lackawanna or Midvale.

Rogers-Brown Iron Co. Elects Officers

At the annual meeting of the Rogers-Brown Iron Co. of Buffalo, March 11, the following officers were elected: William A. Rogers, chairman of the board; William S. Rogers, president; J. Carson Agnew, vice president; C. R. Holzworth, vice president; Charles H. Byron, secretary; Harold T. Clement, treasurer; Edward Cornelius, assistant secretary and treasurer.

Mr. Holzworth has been designated as vice president in charge of coal mines, coke ovens and blast furnaces, which position he has held during the past year. Hugh Kennedy, who has been with the company for nearly 22 years, while retiring as operating vice president remains on the board of directors.

Mr. Agnew has been designated as vice president in charge of iron ore mines, and will move to Buffalo to take active charge of that department. He was formerly with this company, and also with the Mahoning Ore & Steel Co., at Hibbing, Minn. He moved to Philadelphia to assume the position left vacant by the death of H. F. Black, ore agent of the Cambria Steel Co. and was subsequently made assistant to the president of the Midvale Steel & Ordnance Co., which position he held until the merger of that company with the Bethlehem Steel Corp. He then, with his associates in the raw materials department of Midvale, formed Agnew, Batteiger & Co. of Philadelphia and Pittsburgh, which company has been appointed sales agents for the surplus ores of the Rogers-Brown Iron Co.

Dismantle Furnaces

Henry Potts & Co., iron and steel scrap dealers, 1610 Bankers Trust building, Philadelphia, have purchased from the Thomas Iron Co. the Saucon blast furnace located at Hellertown, Pa. Dismantling of the furnace will begin at once. The company now is dismantling the Shenango No. 4 furnace of the Shenango Furnace Co. at Sharpsville, Pa. The Thomas Iron Co., Reading, Pa., also recently sold its two Lock Ridge blast furnaces at Alburtis, Pa. to Butz Bros. of the same city and these likewise are to be dismantled.

Bucyrus Co. Income Gains

The Bucyrus Co., Milwaukee, reports for 1923 net income of $1,299,931 after deducting federal taxes, depreciation and allowing for 9 per cent in back dividends on preferred. In 1922 net earnings totaled $746,301. Resources total $13,608,114 including $581.620 cash, $2,227,467 receivables and $2,765,779 of inventories. Plant account is carried at $7,885,873. The company has no bank loans and surplus at end of 1923 totaled $4,265,744.

Eaton Axle Surplus Gains

The Eaton Axle & Spring Co., formerly known as the Torbensen Axle Co., Cleveland, reports net earnings from operations in 1923 of $369,927. Net credit from acquisition of the assets of the Cox Bumper Co. amounting to $285,000 brought the total net for the year up to $645,927. After paying dividends totaling $441,155, the sum of $213,772 was transferred to surplus, bringing this account up to $6,006,716.

Plant Sets New Record

Pittsburgh, March 18.—New production records were made at the Wheeling Steel Corp.'s tin plate plant at Yorkville, O., last week, 22 mills yielding 4,922,600 pounds of plate. The largest production for one day was 1,006,560 pounds, Feb. 29. The average weight rolled per turn was 14,000 pounds, the highest being 23,320. The average production was 5.37 tons of finished product per mill per turn. The total output is within 33 tons of the largest amount ever rolled with 24 mills. The tonnage for the week would fill 49 freight cars.

Employes Oversubscribe

The United States Steel Corp. has been forced to cut down the individual allotment of stock offered to its employes at par because of the large oversubscription of 100,000 shares set aside for this purpose in January. Employes who subscribed to two shares or less will receive them but those subscribing for more than that number will be reduced 50 per cent. Last year 100,730 shares of common were sold to the employes and this year subscriptions were limited to a similar amount

There are now less than 1,000,000 shares of steel common in brokers' hands while at one time brokers held around 3,000,000. In 1915 the Steel corporation was forced to suspend offerings of preferred stock to workers because of the difficulty experienced in obtaining the stock in the open market.

Equipping Iron Ore Mine

Purchase of the R. S. Porter iron mine properties in what is known as the Peachtree section of North Carolina, by the firm of R. F. MacPhail & Co., of Charlestown, W. Va., has been announced. The new owners are installing a complete new plant at the mines and will start operations soon on an increased basis.

Bethlehem Abandoning Historic Ore Mines

New York, March 18,—The dissolution of the Ramapo Ore Co., Inc., just announced by the office of the secretary of state of New York, marks the final chapter in the story of the Midvale Steel & Ordnance Co.'s New York state iron ore enterprise. In 1917, when there was great activity in the production of iron ore, the Midvale company took a lease on the two historic mines of the Sterling Iron & Railway Co. at Sterling, Orange county, N. Y. It organized the Ramapo Iron Co., Inc., to operate the mines, and began to install modern equipment.

In conformity with the laws of the state which specify that industrial plant operators must provide certain facilities for their employes if they are not otherwise available, the Ramapo company built a schoolhouse at a cost of $100,000. It built a church, and a large number of workmen's houses. It is understood the total expenditure was around $4,000,000.

After the war the company kept on mining but on a slow schedule and it kept the ore on the ground, the accumulation ultimately being about 100,000 tons. When the Bethlehem Steel Co. absorbed the Midvale company it sent its engineers to look over the Sterling property. They reported that the cost of operating was high as compared with the market prices of ore. The corporation decided to take its loss immediately, and it canceled the lease. The equipment which was installed by the Ramapo company has been dismantled and removed as far as possible. The Sterling Iron & Railway Co. now has no plans, as to the operation of the mines.

The Sterling property at one time was one of the most famous in the country. The first blast furnace was built there in 1751. During the revolution, the great iron chain stretched across the Hudson at West Point was manufactured at Sterling from Sterling ore. The mines at Sterling are two in number, including the original Sterling mine and the Lake mine, which has a shaft extending under Sterling lake.

To Move Rolling Mill

Work has begun in dismantling the rolling mill of the Fort Smith Iron & Steel Mills, Fort Smith, Ark., preparatory to moving it to Oklahoma City, Okla. The company was incorporated in 1915 for $25,000 and operates a 10-inch 3-high, 5-stand merchant bar mill, with an annual capacity of 3000 tons. J. W. Arnold is president and general manager and J. E. Arnold secretary and treasurer.

Machinery Buying Is Scattered

Inquiries Still Are Maintained in Good Volume but Buyers Hesitate To Close—Railroad Orders Continue To Provide Much Business—Used Equipment Demand Generally Is Heavier—Crane Market Rather Listless

BUYING of machine tools is scattered with few orders involving more than three or four machines each being placed. Inquiries continue to come out in good volume but buyers show no inclination to follow them up with orders. The market, although hesitant, shows a tendency to quicken as the amount of new inquiry predicts heavier buying during the coming months. So far this year the machine tool market has been one of deferred hopes as large lists have been brought out with little activity in buying. Manufacturers are cheerful over the outlook especially in prospective railroad business.

The Westinghouse Electric & Mfg. Co. has started to purchase tools for its transformer plant at Sharon, Pa., and its plant at Homewood, Pa. A good quantity of machines was bought for these two plants last week. Standard Sanitary Mfg. Co. has added several more tools to its recent bulk purchase of about 22 machines. Buying by the Ford Motor Co. is steady with at least a dozen machines being placed last week. A Cleveland manufacturer also closed on six tools.

New York Central railroad has again extended its requirements but shows little activity in closing on its list of over 100 machines now out. Buying by the Southern railway has not developed in any quantity as yet. Railroad inquiry is well maintained. Marked improvement in foundry operations as reflected in increased castings bookings in February indicate a source of buying which is expected to develop shortly.

Used equipment buying continues to fluctuate. In some districts used machinery dealers are meeting a heavy demand as many inquiries for new tools are being switched to the used equipment field. Small tools are being sold in good volume. Liquidations throughout the country are unloading a large quantity of used tools which is retarding demand in some districts.

Crane demand is rather listless although inquiries are not slackening. One of the largest present inquiries is that of Westinghouse Electric & Mfg. Co. which is to purchase 12 cranes for its plant at Sharon, Pa. Railroad buying of cranes has fallen off somewhat with the bulk of business now being from manufacturers.

Current Sales Under Those of March, 1923

NEW YORK, March 18.—Scattered buying of railroad tools is one of the few features of the local machinery market. The Central of Georgia recently noted as inquiring for four or five machines, has closed on a 90-inch locomotive journal turning lathe; the Missouri Pacific on a 100-ton bushing press and a 400-ton double wheel press and the Richmond, Fredericksburg & Potomac, on a single end vertical punch. The Western Wheeled Scraper Co., Aurora, Ill., has closed on a 6-spindle arch bar drill, while the Lehigh Valley has come into the market for two machines.

The New York Central within the past week has issued an inquiry on four engine lathes, but has made no recent awards against the list of about 100 machines already pending. The Hall Switch & Signal Co., Garwood, N. J., and the Frog & Switch Mfg. Co., Carlisle, Pa., have been recent buyers. Industrial buying includes a 125-ton hydraulic riveter for the Wickes Boiler Co., Philadelphia.

The market as a whole is dull; in fact, buying so far this year has not been on anything like the scale of business placed during the corresponding period of 1923. For a number of manufacturers at least, the past 10 or 11 weeks have been largely a period of deferred hopes. Machine tool manufacturers believe that they have good reason for expecting an improvement shortly, at least in the railroad field. Buying by the Southern railway has not as yet developed in any volume.

Following the substantial buying of a week ago, business in the local crane market has been rather listless. Buying has been spotty, with little of consequence in the way of new inquiry.

Used Tools In Demand

BOSTON, March 18.—Sales of new tools were few the past week, but a noticeable improvement in movement of used equipment has taken place. One dealer reports his last week's sale of used tools was the best this year. One reason for this increase is found in the fact that many sales planned for new equipment now are being switched to the used tool field. Recent orders have been placed by paper manufacturers, textile machine manufacturers, and automotive parts manufacturers in addition to a miscellaneous lot of general machine shops. Railroad inquiry persistently is coming before the trade but sales still are meager. The Maine Central is looked to for a substantial order before the end of the month. Inquiry is diversified but not particularly encouraging. A radio equipment manufacturer has a list of eight tools needed for a plant addition. Another Massachusetts manufacturer is inquiring for several tools. Some encouragement among machine tool dealers is found in reports of recent orders for manufactured products taken in New England.

Dealers' Business Good

CHICAGO, March 18.—Dealers in machinery experienced fairly good business off their floors last week. Outside inquiry has been rather slow and selling corresnodingly light. A feature has been the circularization of the machinery trade by manufacturers offering surplus machinery for sale. For some time machinery dealers have had to contend with the competition of dismantled automobile plants and now apparently they are running into another area of surplus selling. Typical of this is the list promulgated by the Southern Textile Machinery Co., Paducah, Ky., which is offering 32 tools, including milling machines, lathes, punch presses, spindle drill presses and grinders. Machinery dealers state that manufacturers have slowed up in filling orders for special machines. The remainder of the A. O. Smith Co. list, at Milwaukee, is not to be closed for some time. The Atchison, Topeka & Santa Fe railroad apparently has put out its entire list. Its first buying efforts will be concentrated on cranes and power equipment.

Chicago interests have purchased a 30-inch x 14-foot lathe, two large presses and a power squaring machine from a local machinery house. Deals for a half dozen good-sized planers still are hanging fire. A portion of the machinery trade is apprehensive lest the mortality among manufacturers of automobiles be great this year.

All Lines More Active

PITTSBURGH, March 18.—Both new and used machinery has been fairly active this past week. The majority of sales involves single tools with no particularly large lists being closed up except that of the Westinghouse Electric & Mfg. Co. This interest has started to buy for its Sharon, Pa., transformer plant, one dealer receiving an order for a disk grinder and two or three small items; another for a combination punch and shear and a third for a Niagara squaring shear and a small floor crane. The Westinghouse company distributed orders for a number of tools for its plant at Homewood, Pa., one seller receiving two molding machines, two turret lathes, and two small radial drills. Lathes, milling machines, boring mills, etc., were distributed among two prominent sellers.

While the Standard Sanitary Mfg. Co. closed on most of its large machine tool list, 20 or 22 items, as reported last week, with one manufacturer, it also bought two radial drills from the Motch & Merryweather Machinery Co., and an open-side Cincinnati planer. One or two dealers report the sale of new machine tools so far in March as under the rate for February, while others are doing better than the first half of last month.

Some used machinery dealers have had the best week in months. Inquiries still are coming in at a good rate, giving sellers much to work on. Occasionally old propositions are closed up. As reported in IRON TRADE REVIEW of March 13, the eight hot sheet mills and six cold sheet mills for the Youngstown Sheet & Tube Co., were ordered from the United Engineering & Foundry Co. The Hyde Park Foundry & Machine Co. will furnish the hot mill shears. The order for six cranes is yet to be placed. A few crane orders are being placed each week for one or two cranes at a time. One of the largest pending crane inquiries is that of the Westinghouse Electric & Mfg. Co. for Sharon, Pa. 12 items as listed last week.

Improved Demand Noted

CINCINNATI, March 18.—No decided change has taken place in the market for machine tools here, but the situation is better and an improvement in general activity is noted by practically all dealers. Increased buying of single tools is noted while inquiry is more active and general indications are that much buying held up late last year will develop soon. Inquiries are principally for single machines and are exceptionally numerous. It is expected a number of larger lists will come out shortly. Several local manufacturers are working on an inquiry from the Westinghouse Electric & Mfg. Co., which wants several items for East Pittsburgh and more for other plants. An encouraging feature at this time is the marked improvement in foundry operations. Many jobbing foundries now are operating close to capacity. Second-hand equipment buying is spotty with the demand generally good.

Inquiries Fall Off Slightly

CLEVELAND, March 18.—Inquiries for machine tools in this district have slackened somewhat from the large volume of preceding weeks. In some lines demand now is better than at any time this year but the market generally is duller. Buyers are showing little inclination to close on lists now out. Westinghouse Electric & Mfg. Co. bought three tools in this territory last week as did a Detroit automotive manufacturer. Four screw machines were sold to a brass works in the East and a Cleveland manufacturer closed on six tools. A candy machinery manufacturer in Pittsburgh bought three or four machines in this district.

Used equipment demand generally is well maintained, although several dealers are feeling the effects of tools thrown into the market by forced liquidations. A good quantity of small tools continues to be sold with some special and semispecial machines being disposed of last week.

Crane inquiries also have slowed up somewhat in volume, although sales are maintained at the level prevailing during the past several weeks. Increased demand is expected to develop before the end of the present month. Manufacturers and allied industries now compose the bulk of the demand for cranes with railroad orders being fewer.

Crane Awards and Inquiries of the Week

Orders Placed

Five electric overhead cranes for the Norfolk & Western to an eastern builder; specifications call for two 5-ton and two 2-ton cranes of 18-foot span, and one 10-ton, 30-foot span.

Three ditchers for the Southern railroad, to the American Hoist & Derrick Co.

Three 20-ton handpower traveling cranes for the Old Ben Coal Co., Chicago, to Whiting Corp.

Three 20-ton jib cranes for the Nickel Plate railroad, Cleveland, to Whiting Corp.

Three 2-ton, cage controlled monorail hoists for export to Japan, placed through Frazar & Co., New York, to the Shepard Electric Crane & Hoist Co.

Two 15-ton cranes for the Duquesne works of the Carnegie Steel Co., to a northern Ohio manufacturer.

Two 10-ton cranes with 70-foot span for the Blaw-Knox Co., Blawnox, Pa., to the Whiting Corp.

Two 5-ton, handpower cranes, 37-foot span, for an eastern Pennsylvania manufacturer, to the New Jersey Foundry & Machine Co.

Two 3-ton single I-beam cranes, 28-foot span, for the Hershey Machine & Foundry Co., Manheim, Pa., to the Shepard Electric Crane & Hoist Co.

Several bucket handling and handpower overhead cranes for a cement company in Detroit to the Whiting Corp.

Single Machine Orders

25-ton locomotive crane for Stevens-Wood, Inc., to Industrial Works, through Ridenour, Seaver & Kendig, Cleveland, Pittsburgh and Chicago.

25-ton crane for contracting company in St. Louis, to McMyler-Interstate Co.

20-ton crane for scrap dealer in Chicago, to McMyler-Interstate Co.

20-ton crane for cement company in St. Louis, to McMyler-Interstate Co.

18-ton locomotive crane for Material Builders Supply Co., Detroit, to McMyler-Interstate Co.

10-ton crane for contracting company in Windsor, Ont., to McMyler-Interstate Co.

10-ton handpower traveling crane for New Haven Trap Rock Co., New Haven, Conn., to Whiting Corp.

Small jib crane for the Grand Trunk, for installation at Montreal, to the Whiting Corp.

40-ton, 8-wheel, standard gage, steam operated locomotive crane for the Guy Willard Co., St. Paul, to the Orton & Steinbrenner Co.

18-ton, 8-wheel, standard gage, steam operated, locomotive crane, with 7½-kilowatt generator and 45-inch electromagnet, for the Archer Iron & Metal Co., Chicago, to the Orton & Steinbrenner Co.

18-ton, 8-wheel, standard gage, steam operated, locomotive crane for the Canadian National railways, to the Orton & Steinbrenner Co.

7-ton locomotive crane for the O'Hara Contracting Co., Brooklyn, N. Y., to the Orton & Steinbrenner Co.

15-ton locomotive crane for the Republic Creosoting Co., Indianapolis, to the American Hoist & Derrick Co.

20-ton locomotive crane for the Citizens Gas Co., Indianapolis, to the Link-Belt Co.

10-ton handpower crane, 26-foot span, for the Stathmoore Paper Co., Mittineague, Mass., to the New Jersey Foundry & Machine Co.

5-ton crane with 100-foot span and magnet for the Continental Heater Corp., Dunkirk, N. Y., to the Northern Engineering Works.

Orders Pending

Twelve cranes as listed in IRON TRADE REVIEW of March 13 for Westinghouse Electric & Mfg. Co., Sharon, Pa.; bids being taken.

Six cranes for the new sheet mill of the Youngstown Sheet & Tube Co., Youngstown, O.; still in abeyance.

Two 5-ton overhead cranes for Knutsen Motor Trucking Co., Cleveland; pending. H. K. Ferguson Co., engineer and contractor.

10 or 15-ton electric locomotive crane, 30 to 45-foot boom, 45-inch diameter lifting magnet, for M. D. Goodman, 185 Bigelow street, Newark, N. J.; pending.

40-ton electric crane for Wisconsin Valley Electric Co., Wausau, Wis.; L. A. DeGuere, Wisconsin Rapids, Wis., taking bids.

Locomotive crane for the Carnegie Steel Co., Homestead, Pa.; bids being tabulated.

Recent Industrial Business Changes

THE Union Iron Works, Los Angeles, has been appointed exclusive representative for Southern California and Arizona for the products of the Shepard Electric Crane & Hoist Co., Montour Falls, N. Y., manufacturer of cranes, crane equipment, electric hoists, etc. The Union Iron Works will design and fabricate the bridges, craneways and monorail systems, etc., incidental to the crane installations. H. W. Thorne is manager of the industrial department of the Union Iron Works.

* * *

The Curley Pump Co., Indianapolis, has opened sales offices at 826 Massachusetts avenue, that city.

* * *

Spring Makers & Metal Stampers Corp. of America, New York, has changed its name to Aeolue Corp.

* * *

The Ingalls Iron Works Co., Birmingham, Ala., steel fabricator, has taken over the Johnson-Thompson Steel Co., North Birmingham.

* * *

The H. & R. Foundry Co., Cincinnati, recently incorporated, has taken over the plant of Phoenix Foundry Co., Wade street, that city.

* * *

The Crown Machine Co., Milwaukee, has been incorporated for $10,000 to take over the business of A. R. Buchholz, machine shop operator.

* * *

Construction Machinery Co., Los Angeles, equipment and supply dealer, has opened an office and display room at 656 Sixth street, San Diego, Cal.

* * *

Cleveland district sales offices of Sharon Steel Hoop Co., Sharon, Pa., have been moved from the Hanna building to 914 Union Trust building, Cleveland.

* * *

G. J. Hawkey, Cleveland Duplex Machinery Co., Cleveland, recently was appointed representative for the Reed-Prentice Co., Worcester, Mass., in the Cleveland territory.

* * *

The Niles-Bement-Pond Co., 111 Broadway, New York, builder of machine tools, will move its Pittsburgh office from 425 Seventh avenue to 503 Liberty avenue on April 1.

* * *

Thomas R. Heyward Co. has removed its offices and warehouse from the Bowman building, Pittsburgh, to the Pittsburgh Terminal Warehouse, 47 Terminal Way, that city.

* * *

The R. F. Conway Co., 133 West Washington street, Chicago, has organized the Aztec Iron Works to take over the machine shop at 1529 West Forty-eighth avenue at a cost of $86,000.

* * *

The Nagel-Wallace Brass Works, Detroit, fabricator of copper and brass hardware, has opened a sales agency at 3529 Michigan avenue. William Nagel, president, announces plans for enlargement of the company's manufacturing plant.

* * *

Steelform Contracting Co. has opened branch offices at 935 Henry building, Seattle, with S. C. Dean as representative in the Northwest. Company handles steel forms for reinforced concrete joist floor construction.

* * *

Cameto & Caird has taken over the Alameda Aluminum Works, 2417 Clement street, Alameda, Cal., and will specialize in aluminum castings on a production basis. The name of the company has been changed to Modern Foundry & Pattern Works.

* * *

Bethlehem Motors Corp., has purchased the plant at Pottstown, Pa., of the Light Mfg. & Foundry Co. The die casting department of the Light company had been acquired by the Doehler Die-Casting Co., Brooklyn, N. Y., as published in IRON TRADE REVIEW, Feb. 28.

* * *

Youngstown Pressed Steel Co., Youngstown, the Russell, Burdsall & Ward Bolt & Nut Co., Rock Falls, Ill., and the Verona Tool Works, Pittsburgh, recently took leases in the Straus building, Chicago. The Pittsburgh Steel Co., the Pittsburgh Steel Products Co., the Miami Metals Co. and the National Steel Fabric Co. have already taken up their headquarters for Chicago in the Straus building.

* * *

National Drawn Steel Co., East Liverpool, O., manufacturer of cold finished products has appointed F. A. Michell, 428 Bulkley building, Cleveland, as sales representative in that territory. Mr. Michell also represents the Newport Rolling Mill, Newport, Ky., in the Cleveland district.

* * *

The Nashville Bridge Co., Nashville, Tenn., which recently built a fabricating plant at Bessemer, Ala., has sold a considerable interest to the Bessemer, Coal, Iron & Land Co., Birmingham, Ala. H. L. Badham, of the latter company now is on the board of the Nashville Bridge Co.

* * *

Carter Oil Co., subsidiary of the Standard Oil Co. has bought the Parkersburg Machine Co. and the J. B. McKain Fishing Tool Co., oil well tool manufacturers. The Carter company's other tool, forge and machine plants at Sisterville, W. Va., likely will be removed to Parkersburg and consolidated.

* * *

Spencer & Morris, special sales representative of the Union Iron Works, Los Angeles, which recently contracted for the exclusive representation in Southern California of Shepard Electric Crane & Hoist Co., Montour Falls, N. Y., has moved its office from 316 Azusa street to 422 East Third street. Spencer & Morris handle other products besides those of the Union Iron Works and the Shepard company.

* * *

The Raymond Bros. Engineering Co., Chicago, designer of pulverized fuel systems and builder of machinery and equipment for preparation and utilization of pulverized coal, has removed its general sales office to the Combustion Engineering Corp. building, 43 Broad street, New York. H. D. Savage, vice president and general manager, Combustion Engineering Corp. will be in charge of sales.

Construction and Enterprise

Concise and Timely Business Building Opportunities from the Field of Industry

Where additional information is presented, reference is made to date of issue in which previous item appeared.

BIRMINGHAM, ALA.—The Appalachian Iron Co. has been incorporated for $10,000 by W. W. Smith, J. F. Stallings and others.

BIRMINGHAM, ALA.—Dixie Metal Products Co. has been incorporated for $10,000 by W. E. Gilison, Ben Davis and others.

BIRMINGHAM, ALA.—Southern railway has started construction of a locomotive and car repair plant at an expense of $3,000,000 for plants and equipment.

MOBILE, ALA.—The Modern Welded Products Co. has been incorporated for $50,000 by J. J. Blackshear and M. S. Adams.

MALVERN, ARK.—Arkansas Light & Power Co. is constructing $15,000,000 hydroelectric plant including dam and power station developing 120,000 horsepower.

FULLERTON, CAL.—Western Glass Co., Streator, Ill., has awarded construction contracts for factory including administration building, warehouses, machine shop, casting and furnace buildings, etc., to cost from $300,000 to $500,000.

LOS ANGELES—W. T. McFie Co., iron and steel jobber, has purchased 7½-acre tract from American Agricultural Chemical Co., at Alameda street and Slauson avenue, upon which it will build two warehouses comprising 90,000 square feet of floor space. Mrs. W. T. McFie is owner and manager of the company.

OAKLAND, CAL.—Illinois Wire & Cable Co., Syracuse, Ill., plans plant here to handle western production. Washington Miller is engineer. Plant will be 350 x 560 feet, the first unit to be 60 x 400 feet. George E. Dutton is president, H. V. Engh and Max Muller vice presidents, and A. A. Muller secretary and treasurer.

DENVER — General Iron Works Co., Los Angeles, will construct $1,000,000 foundry here according to Robert W. Gordon, general manager of the Stearns-Roger Mfg. Co., manufacturer of mill and mine supplies.

HARTFORD, CONN.—The Adams Fence & Wire Co., Inc., has been incorporated with $50,000 capital.

MILFORD, CONN.—The Burns Metal Goods Co., Inc., has been formed with $50,000 capital.

NEW HAVEN, CONN.—The Allan Lock Corp. has been incorporated for $50,000 to manufacture and deal in locks, etc.

NEW HAVEN, CONN.—Fire recently damaged the scrap metal plant of H. Kasien & Co.

ATLANTA, GA.—Central of Georgia railway will spend between $5,000,000 and $6,000,000 for improvements and extensions this year including shop expansion. L. A. Downs is president.

BERWYN, ILL.—Western Screen & Storm Sash Co., 2108 South Lombard avenue, has been incorporated with 200 shares no par value stock to manufacture screens, sashes, doors, etc., by Dominique Kies, William J. Kies and Richard G. Stege, Jr.

GALESBURG, ILL.—Chicago, Burlington & Quincy railroad will erect a large steel car repair plant, according to W. T. Thiehoff, general manager. Approximately $200,000 will be spent in building and equipping plant.

CHICAGO—Charles Lange & Bros. Co., 2736 Armitage avenue, has purchased a site for a 6-story automobile service station.

CHICAGO—The Calumet Power Co., 72 West Adams street, plans constructing 55,000-horsepower substation and transmission towers at East Gary, Ind., costing about $1,000,000.

CHICAGO—The Ace Mfg. Co., 860 Fletcher street, has been incorporated for $100,000 to manufacture and deal in automobile accessories and mechanical devices, by Nels W. Thybony, Elmer T. Thybony and Adam Hoffman.

CHICAGO—Parker Shock Absorber Co., 2532 South Wabash avenue, has been incorporated for $35,000 to manufacture and deal in automobiles, and motor vehicles, by W. H. Squier, F. P. Hawkins and C. N. Stevens.

CHICAGO—Bell Lock Co., 122 West Adams street, has been incorporated for $250,000 to manufacture and deal in locks of all kinds, by A. E. Newgren, Randolph Thornton and Walter H. Eckert.

CHICAGO—Reliable Gear & Parts Co., Inc., 2015 South Michigan avenue, has been incorporated for $10,000 to manufacture gears, etc., by Louis Meyers, Meyer Kallmeyer and H. L. Mickelson.

CHICAGO—Dale Machinery Co., Inc., 549 West Washington boulevard, has been incorporated for $50,000 to manufacture and deal in machinery, tools, fixtures, etc., by James J. Dale, C. M. Robertson and F. C. Herman.

CHICAGO—Unit Window Weight Co., 10 North Clark street, has been incorporated for $350,000 to manufacture and deal in machinery and appliances, by C. W. Tarbe, E. C. Smeltzer and F. E. Brightman.

CHICAGO—Holtite Mfg. Co., 27 South Des Plaines street, has been incorporated for $75,000 to manufacture dishwashing machines, metal specialties, etc., by Thomas H. Maddock, Jacob H. Jaffe and Florence Berman.

CHICAGO—Linga Carburetor Corp., 29 South La Salle street, has been incorporated for $65,000 to manufacture and sell gasoline carburetors and automobile accessories, by R. Posner, H. R. Porter and E. W. Clark.

CHICAGO—Hebel Oil Heating Engineering Co., 1122 South Michigan avenue, has been incorporated with 100 shares no par value stock, to manufacture, assemble and sell oil burning and heating devices, by Fred Hebel, E. W. Taylor and James H. Mahoney.

CHICAGO—Fullerton Plumbing & Heating Co., 733 West Washington boulevard, has been incorporated for $30,000 to manufacture and deal in plumbing, heating, sewer fixtures, etc., by Christian Hardt, Otto W. Jurgens and Charles E. Gold.

DECATUR, ILL.—Mueller Iron Foundry Co., 2000 East Eldorado street, has been incorporated for $25,000 to do a general foundry business by W. E. Mueller, Robert H. Mueller and Henry A. Bohl.

MELROSE PARK, ILL.—The Electrical Engineers Equipment Co. plant 1-story, $130,000 concrete and brick factory. Fay Woodmansee, 710 West Madison street, Chicago, is president.

ROCKFORD, ILL.—J. H. Krause Supply Co., 633 South Main street, has been incorporated for $50,000 to manufacture, rebuild and deal in machinery and supplies by Lillian Krause, F. W. Smith and J. H. Krause.

STERLING, ILL.—Sterling Level & Tool Co. is planning $30,000, 1-story, 100 x 127-foot factory. William Harley Jr., 32 North State street, Chicago, is architect.

WICHITA, KANS.—Western Iron & Foundry Co. will build a plant addition, 60 x 140 feet, just north of the present building at 702 East Second street. Considerable new equipment, including cranes, drills, hammers and other machinery, are to be installed. The company fabricates structural steel.

PORTLAND, ME.—The Columbia Malleable Castings Corp. has been incorporated for $150,000 with Charles D. Booth as president.

BALTIMORE—Commerce Iron Works, Inc., 1907 Washington boulevard, has been incorporated for $20,000 by A. A. Luthy and Thomas E. Winkler.

BOSTON—The Groce Vaporizer Mfg. Corp. has been incorporated for $50,000 by Charles J. Kane, Dominic F. Marabito and Thomas C. Groce.

BOSTON—The New England Iron Works has awarded construction contracts for $100,000, 1-story, 130 x 180-foot addition to foundry and machine shops.

BOSTON—The Norling Mfg. Corp. has been incorporated for $60,000 to manufacture light, heat and power appliances by Philip A. Hendrick, Arlington, Mass., Agnes L. Murphy and Ina M. Farnham, Brookline, Mass.

BOSTON—The Bay State Copper Co. has been incorporated for $100,000 by Eastwood P. Thompson, Arlington, Mass., Philip E. Coyle, Brookline, Mass., Samuel S. Stevens, Magnolia, Mass., and Edward C. Ramsdell, Westboro, Mass.

CAMBRIDGE, MASS.—General Radio Co. has retained Lockwood, Greene & Co., Boston, engineer, to render engineering services on a 3-story reinforced concrete 50 x 80-foot plant.

DANVERS, MASS.—The American Rim Corp. has been incorporated with $800,000 capital by Clinton K. Seymour, Winchester, Mass.; Henry W. Randall, Beach Bluff, Mass., and Samuel Scott and Charles H. Hanson, Lowell, Mass.

GARDNER, MASS.—The Kobert Machine Co. has been incorporated for $500,000 by Frank P. Kobert and Mildred K. Martin, Worcester, and James A. Redemann, Springfield.

MONSON, MASS.—Rubwood Wheel, Inc.,

plans constructing 3-story, 60 x 300-foot factory near its present plant. Power plant also will be built.

QUINCY, MASS.—Quincy Auto Body & Welding Co., Inc., has been incorporated for $25,000 to make automoble bodies and do a general welding business, by J. A. Anderson and F. K. Anderson, Quincy and Edward Elvander, Roxbury, Mass.

WESTFIELD, MASS.—Federal Abrasive Works, Inc., has been organized with $50,000 capital by Henry F. Chandler, Percy E. Lyndon and William S. Chandler, all of Brookline, Mass.

WORCESTER, MASS.—American Steel & Wire Co. has started work on a 1-story, 64 x 140-foot mill for the manufacture of power cables at the South Works. Clinton S. Marshall, 94 Grove street, is district manager. *Noted Feb. 6.*

BATTLE CREEK, MICH.—Syncro Motors Co., F. J. Clark, president and general manager, plans 1 and 2-story factory additions of brick and concrete. Offices are at 54 Barney street.

MT. MORRIS, MICH.—Industrial Tool & Mfg. Co. has been reorganized into a $500,000 corporation by E. J. Robertson, Flint, Mich. A plant will be constructed for the building of machine tools.

OTSEGO, MICH.—The Angle Steel Stool Co. contemplates the erection of a 60 x 80-foot plant addition.

ST. LOUIS—Laclede Stoker Co. has been incorporated for $10,000 to manufacture stokers, by F. W. Priep and E. W. Jones.

NASHUA, N. H.—The General Tractors Corp. has been incorporated for $200,000 to do a general tractor business and to make iron parts for tractors, with Henry M. Rice, Hancock, N. H., as president.

NEWARK, N. J.—A $35,000 plant addition will be erected by Enstice Bros., general contractor, for Green, Tweed & Co., 109 Duane street, New York, manufacturer of small tools. The company's local plant is at 9 Liberty street.

OGDENSBURG, N. J.—Fire on March 10 damaged only a small shed of the Replogle Steel Co. and not the main plant.

PLAINFIELD, N. J.—Contract for erection of a $500,000 heat treating plant has been awarded by the International Motor Corp.

BRONX, N. Y.—Mott Haven Mill Supply Corp. has been incorporated for $5000 by M. and M. Baffino and F. Prisco with S. Alacchi, 355 East 149th street, as attorney.

BUFFALO, N. Y.—Linde Air Products Co., 155 Chandler street, plans 1-story, 70 x 80-foot, $25,000 plant addition. General contract has been let to J. W. Cowper Co., 714-26 Fidelity building.

MATTITUCK, SUFFOLK CO., N. Y.—Liddell Mfg. Co. has been incorporated with 1000 shares preferred stock $100 par value, 2500 shares common, $10 par value and $125,000 active capital, to build street sweeping machines, by H. V. Crawford, W. A. Patterson and L. C. Fennelly. Hunt, Hill & Betts, 120 Broadway, New York, is attorney.

NEW YORK—Dilg Fleet Mfg. Co. has been incorporated for $50,000 to build machinery, by C. H. J. and A. A. Dilg and R. S. Fleet, with B. S. Deutsch, 281 Broadway, as attorney.

NEW YORK—Varick Electric Mfg. Co. has been incorporated for $10,000 to manufacture electrical machinery by J. Margulies, D. A. Davis and R. Cohen, with Kurtz & Ruby, 141 Broadway, as attorney.

NEW YORK—United Ornamental Iron Works has been incorporated for $10,000 to manufacture and build gas and electrical fixtures, etc., by J. Jacobson, K. Belsito and I. Ferrauto, with S. C. David, 116 Nassau street, as attorney.

OGDENSBURG, N. Y.—Plans have been completed by the A. H. Coplan Co., Hull,

Warehouse Steel Prices

Quotations at Cents Per Pound at Leading Market Centers

STEEL BARS

Boston	3.515c
Buffalo	3.55c
Chicago	3.20c
Cincinnati	3.40c to 3.50c
Cleveland	3.36c
Detroit	3.35c
Los Angeles	3.75c
New York	3.54c
Philadelphia	3.47c
Pittsburgh	3.15c
San Francisco	3.75c
Seattle	3.50c
St. Louis	3.35c
St. Paul	3.45c

IRON BARS

Boston	3.515c
Buffalo	3.50c
Chicago	3.20c
Cincinnati	3.40c to 3.50c
Detroit	3.35c
New York	3.54c
Philadelphia	3.47c
St. Louis	3.35c

SHAPES, STRUCTURAL

Boston	3.615c
Buffalo	3.65c
Chicago	3.30c
Cincinnati	3.50c to 3.60c
Cleveland	3.46c
Detroit	3.45c
Los Angeles	3.85c
New York	3.64c
Philadelphia	3.57c
Pittsburgh	3.25c
San Francisco	3.60c
Seattle (large shapes)	3.60c
St. Louis	3.45c
St. Paul	3.55c

PLATES

Boston	3.615c
Boston, 3/16-inch	3.04c
Buffalo	3.65c
Chicago	3.30c
Cincinnati	3.50c to 3.60c
Cleveland	3.46c
Detroit	3.45c
Detroit, 3/16-inch	3.45c
Los Angeles	4.00c
New York	3.64c
Philadelphia	3.57c
Philadelphia, 3/16-inch	3.82c
Pittsburgh	3.25c
San Francisco	3.75c
Seattle	3.50c
St. Louis	3.45c
St. Paul	3.55c

NO. 10 BLUE ANNEALED SHEETS

Boston, 3/16-inch	4.515c
Buffalo	4.30c
Chicago	4.00c
Cincinnati	4.10c
Cleveland	3.60c to 4.06c
Detroit	4.15c
Los Angeles	5.00c
New York	4.34c
Philadelphia	4.10c
San Francisco	5.00c
Seattle	5.00c
St. Louis	4.10c
St. Paul	4.25c

NO. 28 BLACK SHEETS

Boston	5.00c
Buffalo	5.00c
Chicago	4.70c
Cincinnati	4.90c
Cleveland	4.50c to 4.65c
Detroit	4.85c
Los Angeles	6.20c
Philadelphia	5.15c
New York	4.85c
San Francisco	5.80c
Seattle	6.00c
St. Louis	4.75c
St. Paul	4.95c

NO. 28 GALVANIZED SHEETS

Boston	6.00c
Buffalo	6.10c
Chicago	5.60c
Cincinnati	5.90c
Cleveland	5.60c to 5.80c
Detroit	6.00c
Los Angeles	7.00c
New York	5.85c
Philadelphia	6.25c
San Francisco	6.50c
Seattle	7.00c
St. Louis	5.75c
St. Paul	5.75c to 6.00c

BANDS

Boston	4.315c
Buffalo	4.35c
Chicago	3.95c
Cincinnati	4.00 to 4.10c
Cleveland	4.01c to 4.16c
Detroit	4.10c
Los Angeles	4.65c
New York	4.39c
Philadelphia	4.27c
Pittsburgh	3.95c
San Francisco	4.50c
Seattle	4.50c
St. Paul	4.20c

HOOPS

Boston	5.80c
Buffalo	4.65c
Chicago	4.55c
Cleveland	4.01c to 4.16c
Detroit	4.95c
New York	5.19c
Philadelphia, 1 inch and wider 20 gage and heavier	4.27c
Pittsburgh	3.95c
Seattle	5.50c
St. Paul	4.80c

COLD FINISHED STEEL

Boston (rounds)	4.35c
Boston (shapes)	4.85c
Buffalo (rounds)	4.45c
Buffalo (shapes)	4.95c
Chicago (rounds)	4.00c
Chicago (shapes)	4.50c
Cincinnati (rounds)	4.25c
Cincinnati (shapes)	4.75c
Cleveland (rounds)	4.10c
Cleveland (shapes)	4.60c
Detroit (rounds)	4.30c
Detroit (shapes)	4.80c
Los Angeles (rounds)	5.60c
New York (rounds)	4.40c
New York (shapes)	4.90c
Philadelphia (rounds)	4.35c
Philadelphia (shapes)	4.85c
Pittsburgh (rounds)	4.05c
Pittsburgh (sq. hex. and flats)	4.55c
San Francisco (rounds)	5.50c
Seattle (rounds)	5.00c
St. Paul (rounds)	4.25c

WELDED PIPE

Discounts from warehouse, New York City

Standard Steel Pipe

	Black	Galvanized
¼-⅜-inch butt	—31	+ 2
½-inch butt	—41	—24
¾-inch butt	—46	—32
1/3-inch butt	—48	—34
3½-6-inch lap	—44	—30
7-8-inch lap	—41	—11
9-10-inch lap	—35	— 8
11-12-inch lap	—34	— 6

Wrought Iron Pipe

	Black	Galvanized
¼-⅜-inch butt	+44	+78
½-inch butt	— 4	+19
¾-inch butt	—11	+ 9
1-1½-inch butt	—14	+ 6
2-inch lap	— 5	+14
3-6-inch lap	—11	+ 6
7-12-inch lap	— 3	+16

Bourne-Fuller Service

includes immediate shipment of all Iron and Steel materials from Cleveland and Cincinnati

Warehouses

If you are not receiving our Stock-list we shall be glad to send it to you regularly upon request.

Upson Works

Open Hearth Steel Bars for special uses. Also a complete line of Bolts and Nuts. Prompt Shipments.

THE
BOURNE-FULLER CO.
Iron, Steel
Pig Iron
Coke

CLEVELAND

New York **Chicago**
San Francisco
Cincinnati **Detroit**

Quebec, for erection of a gray iron foundry near here. The cost is estimated around $50,000.

WATERTOWN, N. Y.—Sage Economy Radiator Co. has been incorporated with 2500 shares $100 par preferred stock and 6000 shares no par value common, by J. C. and F. K. Purcell and P. A. Pitcher. Purcell, Cullen & Pitcher, is attorney.

CINCINNATI—The H. & R. Foundry Co. has been incorporated for $25,000 by Harry Hinken, Arthur Remers, Louis Ostrov, Elmer A. Young and Edward F. Korten.

CLEVELAND—Brooks Steam Motors, Inc., has been incorporated for $5000 by Frank E. Baker, T. F. McDonald, E. C. Cambetta, George O. Willet and L. E. Giel. Mr. Baker, Society for Savings building, is attorney.

DOVER, O.—Gripnstik Co. has distributed plans for first group of buildings to be used for the manufacture of a patent wrench and plier. H. N. Bigler is president, C. C. Maurer, vice president, master mechanic at the Dover Mfg. Co., and Fred Potschner, general manager.

GENEVA, O.—Champion Hardware Co. has retained Lockwood, Greene & Co., engineer and builder to render engineering service on 3-story reinforced concrete building, 50x130 feet.

LIMA, O.—Lima Foundries Co., 228 East McKibben street, will expand plant to accommodate recent large orders received, among which was one from Ford Motor Co. J. B. Rountree is general manager.

WARREN, O.—American Roll & Machine Co. has been incorporated for $300,000 by R. E. Shook and J. B. Eastbrook.

PORTLAND, OREG.—American Railway Car Co., 613 Henry building, has commissioned E. A. Miller, architect, to prepare plans for 60x300-foot factory.

CORAOPOLIS, PA.—Standard Steel Spring Co., Fourth avenue, was damaged by fire recently. Operations were not delayed as slight damage was done.

HAMBURG, PA.—A 2-story, 160-foot brick assembling plant will be erected in Allentown, Pa., by the Hahn Motor Co. Butz & Clader, Allentown, has been awarded the general contract.

MONACA, PA.—Patterson Gear Shift & Brake Co., S. E. Fisk, manager, will construct 1-story, 60 x 120-foot, $8000 factory this summer.

PHILADELPHIA—The Atwater Kent Mfg. Co. has awarded the general contract for plant extensions costing $1,000,000, to Erwin & Leighton, 126 North Twelfth street. *Noted March 13.*

PHILADELPHIA—The Henitz Mfg. Co., manufacturer of steel auto bodies, has awarded the general contract to William F. Newberry Co. for erection of a $50,000 factory building at Front and Olney streets.

PHILADELPHIA—General contract will be let shortly by Wm. Sellers & Co., Hamilton and Sixteenth streets, manufacturer of machine tools, on erection of a $50,000 plant addition.

PHILADELPHIA—The Godfrey Roller Co. has awarded the general contract for the erection of a $50,000 manufacturing building at Camac and Spring streets, to A. Raymond Raff Co., 1635 Thompson street.

PHILADELPHIA—General contract for erection of a $205,000 manufacturing building for G. A. Bisler, at Fifth avenue and Brown street, has been awarded to Wm. Steele & Sons Co., 219 North Broad street. Plans call for a 4-story concrete building.

PHILADELPHIA—Contract for the erection of a $20,000 shop for Joseph Kopperman & Son, at 3122-16 New street, has been awarded to Clayton Lofland, 229-31 North Water street.

PHILADELPHIA—Preliminary plans have been completed by Walker & Carswell, architect, for a foundry machine shop for H. S. Getty & Co., Inc., Stokeley street, below Huntington Park.

PHILADELPHIA—The Columbia Steel Equipment Co., Ansberry and Orianna streets, will erect an addition and make several alterations to its plant. J. Frank Clark is architect in charge.

PHILADELPHIA—Contract has been awarded to L. Rosengarten, 4742 Market street, for the erection of a $23,000 warehouse for the Stelwagon Mfg. Co., Sixteenth street and Louden, fabricator of tin plate, etc.

PHILADELPHIA—Contract for the erection of a 1-story addition for the C. H. Wheeler Mfg. Co., Eighteenth and Lehigh streets, manufacturer of plumbing supplies, has been awarded Robert E. Lamb Co., 843 North Nineteenth street.

PHILADELPHIA—Bids have been received by John T. Windrum, architect, on the erection of a substation for Philadelphia Electric Co., Main and Greenlane streets. Bids also have been received on alterations and additions to the substation at Sixty-fifth and Paschall streets, to be erected from private plans.

WILKESBARRE, PA.—Bids are being received by Haynes, Jones & Cadbury Co., 1136 Ridge street, Philadelphia, on a general contract for the erection of an $80,000 branch plant here. The company manufactures plumbing equipment and supplies. McCormick & French, of this city, is architect.

YORK, PA.—United States Chain & Forging Co. will construct addition to plant on which ground will be broken about the middle of April.. Company manufactures tire chains and other commercial chains. Mr. Campbell is sales manager.

ALEXANDRIA, VA.—Temple Foundry, Inc., has been incorporated for $25,000 by Victor E. Beagle and Frank Michelbach, the former being president and the latter secretary.

NORFOLK, VA.—Cherry Welding Corp. has been incorporated for $15,000 by W. M. Cherry and L. D. Early.

NORFOLK, VA.—The Berkley Machine Works & Foundry Co. was badly damaged by fire recently. Damage was confined to the main building.

KALAMA, WASH.—Port of Kalama plans $2,000,000 hydroelectric power project.

TACOMA, WASH.—The Pacific Stove & Foundry Co. has been incorporated for $35,000 by E. N. Stenberg, 505 California building.

APPLETON, WIS.—The Valley Iron Works Co., manufacturer of paper mill machinery, has increased its capital from $400,000 to $550,000 and plans expansion of capacity this summer.

JANESVILLE, WIS.—The Parker Pen Co., manufacturer of fountain pens and metal pencils, will build a 5-story factory addition, 120x130 feet, increasing the output more than 100 per cent by Oct. 1.

MADISON, WIS.—Thomas C. Olson Co., 609 East Washington avenue, has been incorporated to manufacture and deal in machinery, mechanical supplies, castings, etc., by Thomas C. Olson, Clarence E. Lee and Edward K. Olson.

MILWAUKEE—A manufacturing and warehouse addition costing $30,000 will be built by Acme Plumbing & Heating Supply Co. at 373-381 Fourth street.

MILWAUKEE—Gettelman & Marcus Co. has been incorporated to handle scrap metals, with $3000 capital, by Samuel and Benjamin Gettelman and Harry Marcus.

MILWAUKEE—Dunning Heating Supply Co. will spend about $100,000 for building and equipping new plant and warehouse at Fortieth avenue and Mitchell street. Present offices are at 131 Reed street.

NORTH MILWAUKEE, WIS.—The E. R. Wagner Mfg. Co., manufacturer of hardware specialties and general metal products, will build a 2-story addition, 72x75 feet. Architect is Judell & Bogner, Colby-Abbot building, Milwaukee.

Business in Canada

VANCOUVER, B. C.—The Vulcan Iron Works will build a machine shop adjoining its plant on Industrial island.

HAMILTON, ONT.—Canadian Westinghouse Co. is making rapid progress on erection of a foundry on Aberdeen avenue west, to cost $400,000 and is in the market for molding equipment, furnaces for melting metal, jib and traveling electric cranes, etc. *Noted Feb. 28.*

ORILLIA, ONT.—Canadian Yellow Cab Mfg. Co., Ltd., recently incorporated with $50,000 capital stock, has made tentative arrangements with the Carriage Factories, Ltd., for manufacture of taxicab bodies. The company plans to lease a part of the Orillia plant for assembling cabs, for supplying the Canadian and British markets. Officials of the company are Phil H. Geyser, president; Irving B. Babcock, vice president and treasurer; R. Harry Croninger, vice president; W. F. Fielding, secretary. Temporary offices are at 120 St. James street, Montreal, Que.

OTTAWA, ONT.—The Eagle Star Machinery Co., is asking for machinery and tools for manufacture of rechargeable storage batteries. E. Mayhew, Renfrew, Ont., is purchasing agent.

TORONTO, ONT.—The Russell Hardware Co., Ltd., has been incorporated to manufacture and deal in general hardware, plumbers' supplies, etc., with $100,000 capital, by David I. Grant, Gideon Grant and Edwin Smily.

TORONTO, ONT.—The Allsteel Wheel Co. of Canada, Ltd., has been incorporated to manufacture wheels, automobiles, engines, motors, parts, etc., with $200,000 capital, by Douglas Cooper, Robert Fennell, Charles B. Nasmith and others.

TORONTO, ONT.—Roamer Motor Car Co. of Canada, Ltd., has been incorporated to acquire and take over the business, plant, etc., of the Gary Motor Truck Corp. of Canada, Ltd., and to manufacture and sell motor cars, trucks, taxicabs, etc., with $1,000,000 capital, by Frank E. Brown, Franklin B. Eagelson, William H. Sparrow and others.

WATERFORD, ONT.—James Proctor & Redfern, 36 Toronto street, Toronto, Ont., has prepared plans for waterworks plant and system to be constructed here.

WESTON, ONT.—The town council plans addition to waterworks plant here. Engineer, James Proctor & Redfern, 36 Toronto street, Toronto.

WOODSTOCK, ONT.—Bids are being received by Bickle Fire Engines, Ltd., Young street, through the president, Robert S.

Bickle, for erection of a building at Dundas and Young streets, to cost $20,000. The building will be 45 x 200 feet, two stories. Machinery and equipment for the addition will be purchased in the spring. *Noted March 16.*

YORK TOWNSHIP, ONT.—The township council, Grant R. Jack, engineer, is having plans prepared for sewage disposal plant to cost $500,000. Consulting engineer, R. O. Wynne-Roberts, 88 Church street, Toronto.

MONTREAL, QUE.—P. L. Davis, 238 Ontario street west, is in the market for drill press and small lathe.

MONTREAL, QUE.—The Sterns Canadian Knight Motors, Ltd., has been incorporated to manufacture and deal in automobiles, trucks, engines, motors, tools, supplies, etc., with $1,000,000 capital, by Albert Bellemare, Paul Goulet, Louis J. E. Gauthier and others.

MONTREAL, QUE.—The Office Equipment Co. of Canada, Ltd., has been incorporated to manufacture office equipment, furniture, desks, wood, iron and steel products, etc., with $100,000 capital, by Walter A. Merrill, Archibald Stalker, John F. Chisholm and others.

MONTREAL, QUE.—Canadian Pacific railway plans the erection of engine houses and engine house extensions at Three Rivers, St. Gabriel, Grand Piles, Orangeville, Chalk river and Schreiber; coaling plant at Webbwood, and several water tanks of 60,000-gallon capacity.

New Trade Publications

HEAVY STAMPINGS—Interesting details of uses of heavy stampings where other forms of metal formerly were used are presented in a pamphlet by the Federal Pressed Steel Co., Milwaukee, Wis., in its new catalog.

DUST COLLECTORS—The Dust Recovering and Conveying Co., Cleveland, has issued an illustrated bulletin showing the application of dust collectors in filtering fine material from the air.

WELDING TORCHES—Gooseneck welding torches made by the Bastian-Blessing Co., Chicago, are described and illustrated in a bulletin just issued. A new series of torches for the entire range of welding work is being offered in various sizes.

AIR-TIGHT DOORS—Advantages of doors that prevent air leakage in certain places are shown in a bulletin by the Conveyors Corp. of America, Chicago. Suggested uses and a description of the construction of its doors of this type make up the text.

HEAVY STAMPINGS—A booklet issued by the Federal Pressed Steel Co., Milwaukee, under this title illustrates the use of pressed steel parts for various uses and the disk wheels and bumpers which are a standard product of this company.

MICROMETERS—In 24 pages 3 x 6 inches the Reed Small Tool Works, Worcester, Mass., describes recent additions to its line of micrometers, with descriptions of improved designs. Tables of English and metric measurements are given, with instructions how they are to be read.

REFRACTORY LININGS—The Quigley Furnace Specialties Co., New York, in 16 pages of pocket size, describes its highly refractory ganister lining for furnaces. Illustrations of actual methods are presented and varied uses are outlined to indicate the versatility of the material.

AIR COMPRESSORS—Equipment for garages, service stations, tire shops and various industrial requirements is described in a 32-page catalog by the Champion Pneumatic Machinery Co., Chicago. Single and two-stage compressors are featured in various sizes, with halftone illustrations and full specifications of each.

HEAT LOSSES—Bulletins recently issued by the Philip Carey Co., Cincinnati, O., present heat losses from bare iron surfaces, and heat transmission tests to determine the rate of radiation through insulating material of various thicknesses. The bulletins are identical in form with those previously issued on related subjects.

AUTOMATIC COUNTERS — Alliteration seems to be relied on to attract attention to a booklet by the Root Co., Bristol, Conn., manufacturer of automatic counters. The title is "Formula of Facts, Figures and Facilities for Finding Faulty Figures in Production Costs." It deals with the counting of everything from needles to human beings.

OVERHEAD CONVEYING EQUIPMENT—A 225-page catalog is being issued by the Cleveland Electric Tramrail division of the Cleveland Crane & Engineering Co., Cleveland, O. It presents complete descriptions of the company's system of overhead conveying equipment and considerable engineering data, as well as illustrations of installations in various industrial establishments.

VAPOR HEATING SYSTEMS—With 24 airplane views of American cities and a list of representative installations of its heating systems, Warren Webster & Co., Camden, N. J., have indicated the nationwide distribution of its products. Inconspicuously a few pages are devoted to illustrating the salient points of the apparatus. The use of airplane pictures is applied most attractively in this booklet.

SEAMLESS STEEL TUBES—Detailed description of manufacture and technical information of value to men engaged in machine design and engineering involving the use of tubular material are included in a 72-page booklet issued by the National Tube Co., Pittsburgh, under the title "Seamless Tubes and Their Making." The intention of the authors of the text is to stimulate thought of the mechanical possibilities of the material from descriptions of present utilizations.

SAND BLAST—The J. W. Paxson Co., Philadelphia, has issued a 48-page booklet describing sand blast machinery and dust collectors. The various types described include the hose, barrel, tilting, automatic, and table cabinet sand blast. Various equipment for use in conjunction with the sand blast room, such as elevators, tables, and railroad cars, also are described. Helmets, eye protectors, and gloves are listed. The booklet is well illustrated with views of the various types of machines.

WASTE HEAT BOILERS—In a recent bulletin the Wickes Boiler Co., Saginaw, Mich., illustrates various applications of boilers to generate steam from heat wasted after various industrial operations have been completed. After setting forth the conservation of coal made possible by this utilization of what otherwise would be wasted up the stack the company presents illustrations of installations in connection with open hearths, malleable furnaces, etc. Engineering data are presented to show the economy of such boilers.

LOCOMOTIVE CRANES—In a recent bulletin the McMyler-Interstate Co., Cleveland, refers to its 40 years of building cranes, from "whirlies" to its present types and uses the remainder of the 32 pages to describe and illustrate its convertible type of crane which may be operated by steam, electricity or gasoline and be mounted on crawlers, tractor wheels or railroad rails and used with dragline, bucket, shovel or magnet. Construction and parts are illustrated by halftone illustrations, as also is actual operation. Tabulations of various figures of value in relation to the cranes are presented.

ELECTRICAL GENERATING STATION—How a thing is said often means as much as what is said. In presenting the accomplishment of building a large electric power station at Cahokia, opposite St. Louis, the Union Electric Light & Power Co. of Illinois has described this superpower plant in an unusual and interesting manner. The significance of this plant is discussed, not only from the standpoint of domestic and industrial users of power in the St. Louis district, but also with a view of the engineering developments embodied in its design.

MULTIPLE BORING MILL—Actual performance of the automatic multiple spindle machine is described and illustrated by the Bullard Machine Tool Co., Bridgeport, Conn., in 32 pages of clear description entitled "Actualities." Analysis of various operations is presented, typical of the class of work suited to this machine, and time required is shown. The machine is made up of six independent vertical machines grouped about a central control and a series of operations is performed in sequence on six pieces, producing a completely furnished piece in the time consumed by the longest operation.

MINE-CAR AIR COMPRESSOR—The Sullivan Machinery Co., Chicago, has issued a 16-page booklet uniform with its series describing the portable mine-car air compressor. While designed especially for mine work and used most largely in coal mines, they also serve to supply air drills in remote workings, pneumatic tools in steel construction and in various locations where small volumes of air are required for short periods at remote points. They convert available electric current into compressed air at relatively low cost. Illustrations are presented of the machine and its parts and of its actual operation under various conditions.

MATERIAL HANDLING EQUIPMENT—A catalog on material handling equipment recently issued by the Yale & Towne Mfg. Co., Stamford, Conn., presented as a reference book for the engineer, plant superintendent, architect, purchasing agent and salesman. It contains complete details of chain blocks, trolleys and electric chain hoists manufactured by this company and shows tables of dimensions, weights, clearances, and lifting, lowering and running speeds. A feature is an article by Henry R. Towne, for years president of the Yale & Towne Mfg. Co. and at present chairman of the board of directors, discussing the comparative efficiency of the three types of chain hoists.

Iron and Steel Prices

Iron Ore

LAKE SUPERIOR ORES
Per Gross Ton Lower Lake Ports

Old range bessemer, 55 per cent iron.$6.45
Mesabi bessemer, 55 per cent iron.... 6.20
Old Range nonbessemer, 51½ per cent iron 5.70
Mesabi nonbessemer, 51½ per cent iron 5.55

EASTERN LOCAL ORES

Cents per unit delivered at Eastern Pennsylvania and New Jersey furnaces

Foundry and basic, 53 to 63 per cent ..... 10.00 to 11.00
Copper free low phosphorus 53 to 65 per cent ..... 13.25 to 16.50

FOREIGN IRON ORE

Cents per unit, c.i.f. Atlantic ports

Spanish low phosphorus, 52 to 54 per cent ..... 9.00 to 10.00
Algerian low phosphorus, 52 to 54 per cent ..... 10.00 to 10.50
Swedish and Norwegian low phosphorus, 68 per cent.... 11.00 to 12.00
Swedish foundry or basic, 66 to 68 per cent ..... 9.25 to 10.00
Spanish foundry or basic, 50 to 54 per cent 9.00

Manganese Ore

Prices do not include duty at rate 1 per cent per pound of metallic manganese contained.

Brazilian, minimum 47 per cent.....
.....nominal 44 cents c.i.f. tidewater
Indian, minimum 47 per cent.....
...nominal 44 to 44½ cents c.i.f. tidewater
Caucasian, 53 to 55 per cent.....
.....Ordinary, 42 cents, c.i.f. tidewater
.....Washed, 45 cents, c.i.f. tidewater

Fluor Spar

85 and 5 per cent grade

Washed gravel, Kentucky and Illinois mines, per net ton.$19.75 to 23.50
Washed gravel, imported, duty paid eastern tidewater, per gross ton ..... 20.60 to 21.10

Rivets

Structural rivets, C. L. Pitts.. 2.70c to 2.75c
Structural rivets, L.C.L. Pitts..... 2.90c
Rivets, 7/16-in. and smaller.....
.....65, 10 and 5 to 70 and 10 off

Nuts and Bolts

(Up to 1¼ and 1⅜ inches inclusive)

Hot pressed square or hexagon blank .....$4.25 off list
Hot pressed square or hexagon tapped .....$4.25 off list
Cold punched square or hexagon blank .....$4.00 off list
Cold punched, square or hexagon.....$4.00 off list
Cold punched semifinished hexagon nuts ⅝-inch and larger.....75 and 5 off
Cold punched semifinished hexagon nuts 9/16-inch and smaller.....80 and 5 off
Price f.o.b. Pittsburgh, packages of 50.

CARRIAGE BOLTS

(⅜ x 6 inches, smaller and shorter)

Rolled thread .....60 and 5 off
Cut thread .....50, 10 and 5 off
Larger and longer.....50, 10 and 5 off

MACHINE BOLTS

(⅜ x 4 inches, hot pressed nuts)

Rolled thread .....60, 10 and 5 off
Cut thread .....60 and 5 off
Larger and longer.....60-10 to 60-5 off

(⅜ x 4 inches, cold punched nuts)

Cut thread .....50, 5 off
Larger and longer .....50, 5 off
Lag screws .....65 and 5 off
Plow bolts Nos. 1, 2 and 3 heads.....
..... 50 and 10 off
4 to 10 heads .....50-10 + 20 off
Flat and round head stove bolts.....
..... 75, 10 and 5 off
Other stove bolts .....75 and 5 off
Tap bolts .....25 and 10 off
Bolt ends with hot pressed nuts.....
.....60 nd 5 off
Bolt ends with cold punched nuts.....
.....50 and 5 off
Blank bolts .....60 and 10 off
Rough stud bolts with nuts.....
.....45 and 5 off

Washers

Wrought washers .....$5.00 to $5.50 off

Steel Pipe

(Effective April 19, 1923)
Pittsburgh basing discounts, jobbers' carloads.

	Black	Galvanized
Butt Weld		
⅛-inch	45	19½
¼ and ⅜-inch	51	25½
½-inch	56	42½
¾-inch	60	48½
1 to 3-inch	62	50½
Lap Weld		
2-inch	55	43½
2½ to 6-inch	59	47½
7 to 8-inch	56	43½
9 and 10-inch	54	41½
11 and 12-inch	53	40½
REAMED AND DRIFTED		
Butt Weld		
1 to 3-inch	60	48½
Lap Weld		
2-inch	53	41½
2½ to 6-inch	57	45½
EXTRA STRONG—PLAIN ENDS		
Butt Weld		
⅜-inch	41	24½
¼ and ⅜-inch	47	30½
½-inch	53	42½
¾-inch	58	47½
1 to 1½-inch	60	49½
2 to 3-inch	61	50½
Lap Weld		
2-inch	53	42½
2½ to 4-inch	57	46½
4½ to 6-inch	56	45½
7 to 8-inch	52	39½
9 and 10-inch	45	32½
11 and 12-inch	44	31½
DOUBLE EXTRA STRONG		
Butt Weld		
½-inch	42	32½
¾ to 1½-inch	45	35½
2 to 2½-inch	47	37½
Lap Weld		
2-inch	41	32½
2½ to 4-inch	43	34½
4½ to 6-inch	42	33½
7 to 8-inch	38	25½

Wrought Iron Pipe

(Effective Jan. 23, 1923)
Pittsburgh basing discounts, jobbers, carloads

THREADS AND COUPLINGS		
Butt Weld		
¼ and ⅜-inch	+11	+39
½-inch	22	2
¾-inch	28	11
1 to 1½-inch	30	13
Lap Weld		
1¼ and 1½-inch	Upon application	
2-inch	23	7
2½ to 6-inch	26	11
3 to 6-inch	28	13
7 to 12-inch	26	11
PLUGGED AND REAMED		
Two points less than above		
EXTRA STRONG, PLAIN ENDS		
Butt Weld		
¼ and ⅜-inch	+19	+54
½-inch	21	7
¾-inch	28	12
1 to 1½-inch	30	14
Lap Weld		
2-inch	23	9
2½ to 4-inch	29	15
4½ to 6-inch	28	14
7 to 8-inch	21	7
9 to 12-inch	16	2
DOUBLE EXTRA STRONG		
Butt Weld		
½-inch	+47½	+59½
¾-inch	+28	+40
1-inch	+34	+46
1¼-inch	+28	+40
1½-inch	+27	+39
Lap Weld		
2 and 2½-inch	+13	+25
3 to 4-inch	+ 8	+17
4½ to 6-inch	+ 9	+18
8-inch	+12	

Boiler Tubes

L. C. L. discounts. C. L. 4 points larger

STEEL (Lap welded)
(Effective April 19, 1923)

2 and 2¼-inch ..... 23 off
2½ and 2¾-inch ..... 33 off
3-inch ..... 36 off
3¼ to 3¾-inch .....38½ off
4 to 13-inch ..... 42 off

CHARCOAL IRON
(Effective April 12, 1923)

1½-inch .....+22
1¾-inch .....+12
2 and 2¼-inch .....+ 2
2½ to 3-inch 3
3¼ to 4½-inch 5

SEAMLESS COLD DRAWN
(Effective April 19, 1923)

1-inch ..... 51 off
1¼ and 1½-inch ..... 43 off
1¾-inch ..... 27 off
2 and 2¼-inch ..... 18 off
2½ and 2¾-inch ..... 28 off
3 and 3¼-inch ..... 32 off
3½ and 3¾-inch ..... 33 off
4-inch ..... 37 off
4½and 5-inch ..... 29 off

SEAMLESS HOT ROLLED

3 and 3¼-inch ..... 34 off
3½ and 3¾-inch ..... 35 off
4-inch ..... 39 off

SEAMLESS STEEL MERCHANT BOILER TUBES

Extras:

Add $8 per net ton for more than four gages heavier than standard and add 10 per cent to theoretical weight

Add 5 per cent for lengths over 24 feet and not over 26 feet.

Smaller tubes than 1-inch and lighter than standard gage to be sold at mechanical tubing list and discount.

Intermediate sizes and gages not listed above take price of next larger outside diameter and heavier gage.

SEAMLESS STEEL MECHANICAL TUBING
Base Discounts

Carbon, 0.10 to 0.20 per cent..... 83 off
Carbon, 0.30 to 0.40 per cent..... 81 off
Carbon, 0.40 to 0.50 per cent....net price
Plus differentials and extras for cutting.

SEAMLESS STEEL LOCOMOTIVE AND SUPERHEATER TUBES
(Effective April 19, 1923)

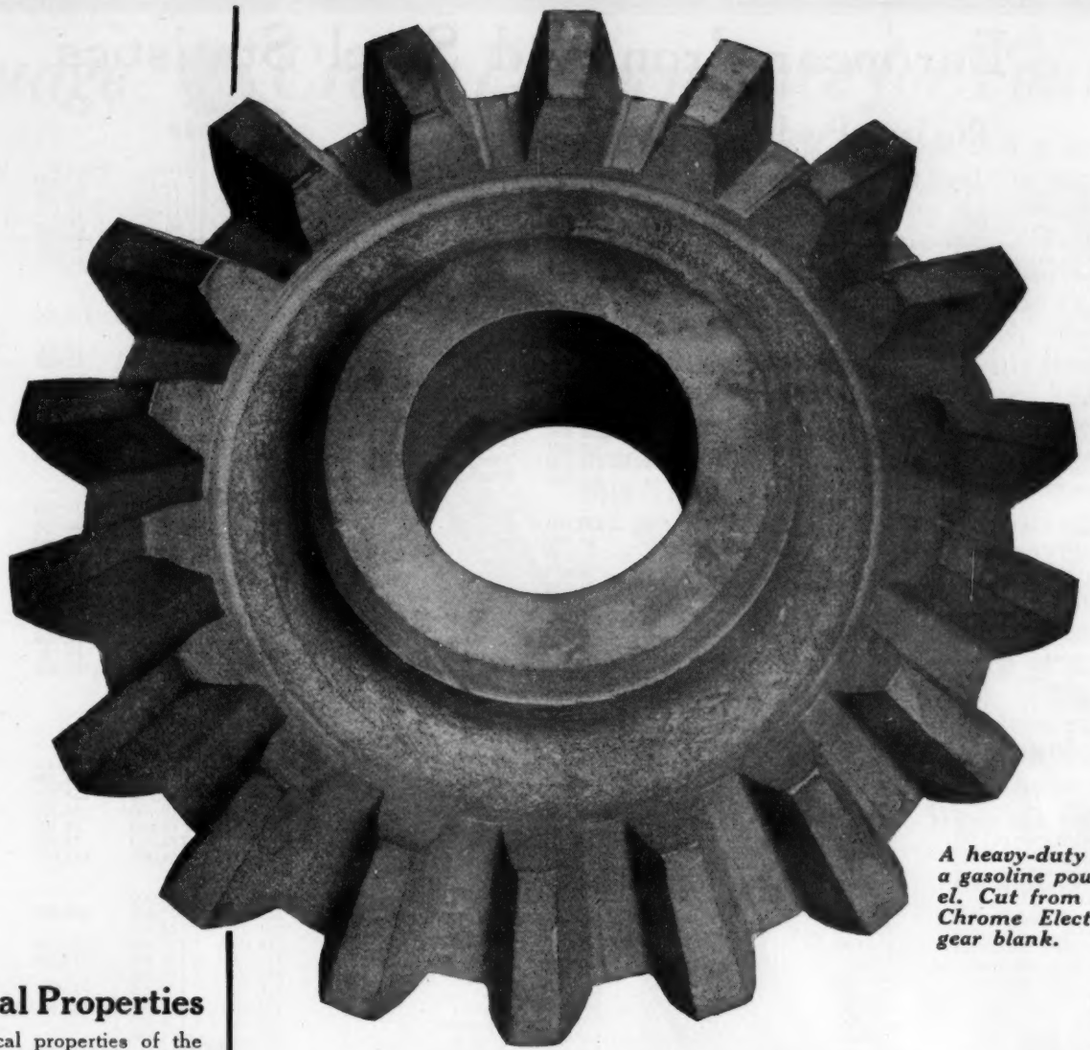
Outside diameter	Gage	Net prices per foot f.o.b. Pittsburgh Price
2-inch	12-gage	15c
2-inch	12-gage	15c
2-inch	11-gage	16c
2-inch	10-gage	17c
2¼-inch	12-gage	17c
2¼-inch	11-gage	18c
2¼-inch	10-gage	20c
3-inch	7-gage	35c
1½-inch	9-gage	15c
5⅝-inch	9-gage	55c
5½-inch	9-gage	57c

Plus usual extras for forming and for long lengths.

Hot Rolled Alloy Steels

Prices per pound, Pittsburgh

S. A. E. Series—	
2300 (3½ per cent nickel)...	5.25c
3100 (nickel chromium).....	4.25c
6100 (chrome vanadium).....	5.00c
6100 (chrome vanadium spring)	4.75c
9250 (Silico manganese spring)	4.00c to 4.25c



A heavy-duty gear for a gasoline power shovel. Cut from a Sivyer Chrome Electric cast gear blank.

Physical Properties

The physical properties of the Chrome Steel gear blank when it leaves the Sivyer foundry, are as follows:

Tensile strength.....95,000 lbs.
Yield Point .....55,000 lbs.
Elongation in 2" 18%
Reduction in Area.....25%

To further increase these properties the cut gear is subjected, by the manufacturer using it, to a treatment, consisting of heating and quenching in oil. After this treatment the metal shows a sclerescope hardness of 50 to 60 and is so tough that the possibility of teeth shearing in service is virtually eliminated.

Not only do the Sivyer blanks insure a better gear to the customer, but they effect an actual saving to the manufacturer. The cast blank cuts down expensive machining and waste metal. It, also, reduces inventory costs, for the Sivyer blanks can be made up in large or small quantities, on short notice.

Tool Steel Toughness At a Decided Saving

SIVYER Chrome Electric Steel gives the above gear a dense close-grained toughness that can be rivaled only by the highest grade tool steel. The Sivyer gear-blank is cast to the approximate size and shape of the finished gear and the shaft hole is cored. This saves many of the expensive drilling and machining operations that were necessary when forged blanks were used.

SIVYER STEEL

SIVYER STEEL CASTING COMPANY, MILWAUKEE

European Iron and Steel Statistics

Gross Tons

Pig Iron Production

	United Kingdom	France	Belgium	Luxembourg
Monthly average 1912..	729,000	405,000	192,000	184,800
Monthly average 1913..	855,000	427,000	205,800	209,000
Monthly average 1919..	617,000	198,000	20,600	50,000
Monthly average 1920..	669,500	281,700	92,700	58,000
Monthly average 1921..	217,600	280,300	71,800	79,600
Monthly average 1922..	403,300	428,900	131,500	137,500
1922				
January	288,000	307,000	92,700	99,900
February	300,100	318,000	90,300	95,200
March	389,800	370,000	116,500	130,900
April	394,300	377,300	112,000	128,800
May	407,900	435,300	117,100	139,300
June	369,200	409,300	113,100	141,500
July	399,100	421,400	125,200	147,800
August	411,700	440,400	151,500	147,800
September	430,300	454,600	160,600	149,400
October	481,500	495,600	172,000	162,600
November	493,900	505,500	169,600	151,300
December	533,700	506,200	157,900	156,700
1923				
January	567,900	478,600	157,800	139,500
February	543,400	300,800	149,000	86,500
March	633,600	311,200	167,300	93,900
April	652,200	345,000	169,600	94,400
May	714,200	387,300	163,500	84,300
June	692,900	440,000	169,300	88,400
July	655,100	429,600	184,400	120,900
August	599,800	478,700	195,800	132,900
September	558,600	474,300	191,100	124,900
October	595,700	506,200	193,400	131,900
November	598,200	527,800	201,900	135,700
December	626,900	555,800	206,100	150,800

Ingots and Castings Production

	United Kingdom	France	Belgium	Luxembourg
Monthly average 1912..	566,000	363,000	206,000	79,400
Monthly average 1913..	639,000	385,000	202,300	109,000
Monthly average 1919..	658,000	179,000	27,400	32,000
Monthly average 1920..	755,600	250,200	101,300	49,000
Monthly average 1921..	302,100	254,500	65,000	62,300
Monthly average 1922..	486,000	372,000	128,200	114,000
1922				
January	327,500	309,000	78,400	75,600
February	418,800	311,800	82,700	75,100
March	549,400	361,200	104,000	99,200
April	404,200	319,300	95,200	98,100
May	462,300	358,100	161,500	112,200
June	400,200	352,500	111,300	121,600
July	473,100	362,900	112,500	125,600
August	528,400	390,300	149,100	129,200
September	555,900	400,300	154,900	132,600
October	565,201	423,000	179,600	136,800
November	600,800	404,100	174,600	130,200
December	546,100	408,100	166,700	131,600
1923				
January	634,100	401,400	159,800	121,500
February	707,100	285,300	154,700	72,400
March	802,500	310,900	181,100	78,500
April	749,400	349,200	167,700	77,600
May	821,000	387,300	169,100	72,300
June	767,700	420,700	186,000	73,200
July	639,500	393,300	178,900	94,200
August	567,500	445,300	209,300	108,000
September	695,100	439,500	191,200	104,600
October	702,100	469,200	212,800	124,400
November	749,500	484,800	213,900	119,700
December	653,300	517,300	209,300	132,600

Imports

	United Kingdom	France	Belgium	Germany
Average monthly 1912..	166,400	16,400	87,000	27,300
Average monthly 1913..	185,900	12,900	68,900	25,000
Average monthly 1919..	42,400	113,100	44,400	.....
Average monthly 1920..	92,400	89,000	67,000	26,200
Average monthly 1921..	137,100	38,500	43,300	.....
Average monthly 1922..	73,500	64,300	42,000	199,000
1922				
January	88,700	36,600		68,200
February	64,600	55,800	139,000	66,900
March	63,800	67,300		105,700
April	59,900	89,100	32,400	129,000
May	60,900	41,100	62,400	154,300
June	52,800	73,200		137,700
July	55,900	54,800		182,900
August	80,100	40,300	129,700	181,800
September	70,600	50,000		175,000
October	90,600	109,200		233,800
November	79,800	58,500	140,000	186,700
December	114,000	109,500		239,600
1923				
January	128,900	55,800	45,100	191,300
February	122,700	63,800	40,000	82,500
March	111,000	38,000	35,200	93,200
April	115,400	44,200	32,800	143,900
May	82,200	37,000	34,100	127,400
June	105,100	55,700	39,600	134,000
July	114,100	57,600	42,200	117,800
August	115,100	53,500	52,700	212,800
September	116,400	52,500	46,900	171,300
October	106,300	65,400	39,700	158,300
November	97,500	110,100	59,800	.....
December	108,100	.....	.....	.....

Exports

	United Kingdom	France	Belgium	Germany
Average monthly 1912..	400,600	41,500	124,500	482,400
Average monthly 1913..	414,100	48,200	128,800	416,900
Average monthly 1919..	186,100	19,400	14,500	.....
Average monthly 1920..	270,900	74,600	74,300	143,600
Average monthly 1921..	141,700	132,700	75,900	176,000
Average monthly 1922..	283,400	164,000	143,000	209,700
1922				
January	235,300	164,000		218,200
February	223,400	107,000	198,400	170,000
March	295,800	72,300		208,700
April	258,400	125,800	83,900	195,500
May	272,400	122,200	279,600	204,500
June	236,300	180,300		209,132
July	251,700	182,100		206,200
August	270,000	168,400	522,600	181,300
September	279,200	174,000		223,500
October	347,100	235,600		229,908
November	372,300	181,300	631,200	210,000
December	114,000	221,700		258,900
1923				
January	353,400	158,500	202,200	212,900
February	317,600	236,500	162,200	183,500
March	368,100	139,200	200,000	115,100
April	387,000	120,600	192,000	105,100
May	424,500	40,000	181,200	91,700
June	365,100	125,200	184,500	63,100
July	307,700	173,300	217,200	91,400
August	323,900	187,600	210,500	103,300
September	334,000	234,000	211,110	90,900
October	388,600	227,900	259,000	87,300
November	394,900	214,200	210,900	.....
December	354,900	.....	.....	.....

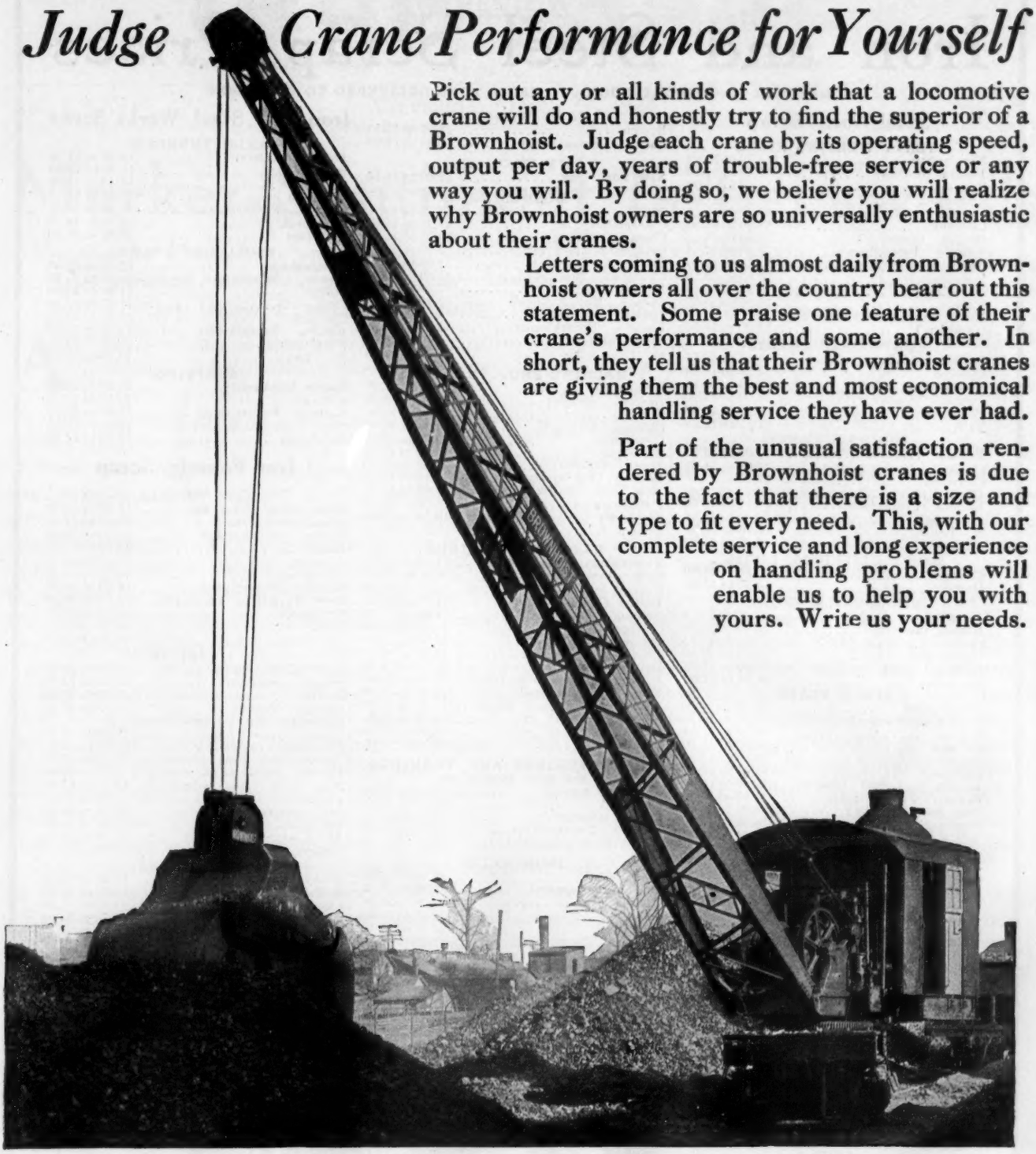
Note—Belgian figures include Luxembourg since May 1, 1922.
Export and import figures do not include scrap.

American Iron and Steel Exports and Imports

Gross Tons

	Imports	Exports
1924		
January	26,677	251,284
1923		
December	27,012	179,215
November	26,534	186,770
October	29,884	154,079
September	36,612	173,664
August	45,432	163,010
July	53,448	170,259
June	68,019	172,747
May	75,891	204,988
April	77,909	179,159
March	106,206	165,624
February	67,707	135,182
January	120,080	124,444
Total	734,734	2,009,141
1922		
December	96,358	154,087
November	152,250	124,004
October	184,202	131,542
September	76,393	128,370
August	49,054	144,264
July	62,426	157,027
June	39,154	216,298
May	23,098	229,616
April	18,720	197,562
March	12,774	206,474
February	11,535	133,333
January	13,404	155,962
Total	643,010	1,988,539
1921		
December	9,400	134,348
November	9,296	125,492
October	10,609	106,466
September	11,743	94,650
August	8,069	75,641
July	10,040	85,520
June	8,260	119,021
May	10,915	140,987
April	4,847	160,921
March	14,492	210,451
February	3,650	387,900
January	15,784	516,447
Total	117,105	2,156,818
Yearly Totals		
1920	448,833	4,920,913
1919	327,490	4,405,281
1918	168,225	5,372,424
1917	324,565	6,442,240
1916	310,891	5,947,646
1915	282,396	3,532,564
1914	289,775	1,549,554
1913	317,260	2,745,635
1912	225,072	2,947,596
1911	262,457	2,187,725
1910	510,730	1,537,943
1909	363,984	1,243,583
1908	205,845	964,242
1907	662,358	1,301,981
1906	577,809	1,325,740
1905	416,000	1,010,255
1904	266,398	1,167,674
1903	1,178,797	326,590
1902	1,212,484	411,915
1901	221,297	81,211
1900	209,955	286,687

Judge Crane Performance for Yourself



Pick out any or all kinds of work that a locomotive crane will do and honestly try to find the superior of a Brownhoist. Judge each crane by its operating speed, output per day, years of trouble-free service or any way you will. By doing so, we believe you will realize why Brownhoist owners are so universally enthusiastic about their cranes.

Letters coming to us almost daily from Brownhoist owners all over the country bear out this statement. Some praise one feature of their crane's performance and some another. In short, they tell us that their Brownhoist cranes are giving them the best and most economical handling service they have ever had.

Part of the unusual satisfaction rendered by Brownhoist cranes is due to the fact that there is a size and type to fit every need. This, with our complete service and long experience on handling problems will enable us to help you with yours. Write us your needs.

The Brown Hoisting Machinery Co., *Cleveland, Ohio*

Branch Offices: New York, Chicago, Pittsburgh, San Francisco, New Orleans, London, Eng.

BROWNHOIST

MATERIAL HANDLING MACHINERY

Iron and Steel Scrap Prices

CORRECTED TO TUESDAY NOON GROSS TONS DELIVERED TO CONSUMER

Steel Works Scrap

HEAVY MELTING STEEL

Birmingham	14.00 to 15.00
Boston (dealers)	12.00 to 12.50
Buffalo	17.50 to 18.00
Chicago	16.50 to 17.00
Cleveland	18.00 to 18.25
Cincinnati	15.00 to 15.50
Detroit (dealers)	15.50 to 16.00
Eastern Pennsylvania	17.00 to 18.00
New York (dealers)	12.50 to 13.00
Pittsburgh	20.00 to 20.50
St. Louis	16.50 to 17.00
Valleys	19.50 to 20.00
No 1 railroad steel New York (dealers)	13.00 to 13.50

COMPRESSED SHEETS

Buffalo	17.50 to 18.50
Chicago	13.50 to 14.00
Cleveland	16.25 to 16.50
Detroit (dealers	14.00 to 14.50
Pittsburgh	17.50 to 18.00
Valley	17.75 to 18.25

BUNDLED SHEETS

Buffalo	13.00 to 13.50
Cincinnati	11.00 to 11.50
Cleveland	12.00 to 12.50
Detroit	11.50 to 12.00
Eastern Pennsylvania	14.50 to 15.00
Pittsburgh	16.00 to 16.50
St. Louis	11.00 to 11.50
Valleys	15.00 to 15.25

SHEET CLIPPINGS, LOOSE

Chicago	11.00 to 11.50
Detroit	10.50 to 11.00

STEEL RAILS, SHORT

Birmingham	12.00 to 12.50
Boston (dealers)	12.00 to 12.50
Chicago	20.00 to 20.50
Cincinnati	19.00 to 19.50
Cleveland (over 6 pt.)	17.50 to 17.75
St. Louis	20.50 to 21.00

STOVE PLATE

Birmingham	15.50 to 16.00
Boston (consumers)	16.00 to 16.50
Buffalo	16.50 to 17.00
Chicago	18.00 to 18.50
Cincinnati (net iron)	11.50 to 12.00
Cleveland	16.25 to 16.50
Detroit (net ton) (dealers)	15.50 to 16.00
Eastern Pennsylvania	16.50 to 17.50
New York (dealers)	13.00 to 14.00
Pittsburgh	14.50 to 15.00
St. Louis	18.75 to 19.25

LOW PHOSPHORUS

Buffalo	22.50 to 23.00
Cincinnati	15.50 to 16.00
Eastern Pennsylvania	23.00 to 24.00
Pitts., billets and bloom crops	24.00 to 24.50

SHOVELING STEEL

Chicago	16.25 to 16.75
Pittsburgh	15.50 to 16.00
St. Louis	16.50 to 17.00

KNUCKLES, COUPLERS, SPRINGS

Chicago	20.00 to 20.50
Eastern Pennsylvania	23.00 to 23 50
Pittsburgh	21.50 to 22.00
St. Louis	22.00 to 22.50

FROGS, SWITCHES, GUARDS

Chicago	17.50 to 18.00
Eastern Pennsylvania	17.00 to 18.00
St. Louis	18.50 to 19.00

BOILER PLATE, CUT

St. Louis	11.75 to 12.25

ANGLE BARS—STEEL

Chicago	19.00 to 19.50
St. Louis	19.00 to 19.50

Iron Mill Scrap

RAILROAD WROUGHT

Birmingham	12.00 to 13.00
Boston (dealers)	13.50 to 14.00
Buffalo	16.00 to 17.00
Cleveland, No. 1	15.00 to 15.50
Chicago, No. 1	16.00 to 16.50
Chicago, No. 2	16.50 to 17.00
Cincinnati, No. 1	12.50 to 13.00
Detroit, No. 2	15.50 to 16.00
Eastern Pennsylvania	19.00 to 20.00
New York, No. 1 (dealers)	15.00 to 16.00
Pittsburgh, No. 1	17.00 to 17.50
Pittsburgh, No. 2	20.00 to 20.50
St. Louis, No. 1	16.50 to 17.00
St. Louis, No. 2	17.00 to 17.50

WROUGHT PIPE

Boston (dealers)	11.50 to 12.00
Buffalo	13.50 to 14.00
Eastern Pennsylvania	15.00 to 16.00
New York (dealers)	10.50 to 11.00

YARD WROUGHT

Boston	12.00 to 12.50
Eastern Pennsylvania	17.00 to 18.00

CITY WROUGHT

New York, long	15.00 to 15.50

BUSHELING

Buffalo	15.00 to 15.50
Chicago, No. 1	14.25 to 15.00
Chicago, No. 2	10.25 to 10.75
Cincinnati, No. 1	11.50 to 12.00
Cleveland, No. 1	12.00 to 12.25
Cleveland, No. 2	11.50 to 12.00
Detroit, No. 1	12.00 to 12.50
Detroit, No. 2 (new)	13.00 to 13.50
Detroit, No. 2 (old)	9.50 to 10.00
Eastern Pennsylvania	15.50 to 16.00
Pittsburgh, No. 1	16.50 to 17.00
St. Louis, No. 1	16.75 to 17.25

MACHINE SHOP TURNINGS

Birmingham	8.00 to 9.00
Boston (dealers)	10.00 to 10.50
Buffalo	12.00 to 12.50
Chicago	10.00 to 10.50
Cincinnati	10.00 to 10.50
Cleveland	13.75 to 14.00
Detroit (dealers)	11.00 to 11.50
Eastern Pennsylvania	14.50 to 15.00
New York (dealers)	11.00 to 11.50
Pittsburgh	15.00 to 15.50
St. Louis	10.50 to 11.00
Valleys	13.75 to 14.00

CAST IRON BORINGS

Birmingham (chemical)	15.00 to 16.00
Birmingham (plain)	9.00 to 10.00
Boston (chemical)	12.00 to 12.25
Boston (dealers)	11.00 to 11.50
Buffalo	14.00 to 14.50
Chicago	14.00 to 14.50
Cincinnati	11.00 to 11.50
Cleveland	14.25 to 14.50
Detroit (dealers)	11.50 to 12.00
Eastern Pennsylvania (chem.)	17.00 to 18.00
Eastern Pennsylvania	15.00 to 15.50
New York (dealers' price)	11.50 to 12.00
Pittsburgh	15.50 to 16.00
St. Louis	13.00 to 13.50
Valleys	14.75 to 15.00

MIXED BORINGS AND TURNINGS
For blast furnace use

Boston (dealers)	10.00 to 10.50
Cleveland	14.25 to 14.50
Detroit (dealers)	11.25 to 11.75
Eastern Pennsylvania	14.50 to 15.00
New York (dealers)	11.25 to 11.75

IRON AXLES

Birmingham	21.00 to 21.50
Boston (consumers)	31.00 to 32.00
Buffalo	28.00
Chicago	32.00 to 32.50
Cincinnati	22.50 to 23.00
Eastern Pennsylvania	26.00 to 28.00
New York (dealers)	25.75 to 26.25
St. Louis	30.50 to 31.00

IRON RAILS

Buffalo	20.00 to 21.00
Chicago	19.50 to 20.00
Cincinnati	14.50 to 15.00
St. Louis	17.00 to 17.50

PIPES AND FLUES

Chicago	11.50 to 12.00
Cincinnati	10.00 to 10.50
Cleveland	12.25 to 12.50
St. Louis	13.00 to 13.50

RAILROAD GRATE BARS

Buffalo	17.50 to 18.00
Chicago	17.00 to 17.50
Cleveland	16.25 to 16.50
Eastern Pennsylvania	16.50 to 17.50
New York (dealers)	14.00 to 14.50
St. Louis	19.00 to 19.50

FORGE FLASHINGS

Boston (dealers)	10.00 to 10.50
Chicago, small	12.00 to 12.50
Cleveland (under 10 in.)	12.25 to 12.50
Cleveland (over 10 in.)	12.00 to 12.25
Detroit (dealers)	12.00 to 12.50

FORGE SCRAP

Boston (dealers)	10.50 to 11.00
Chicago	19.50 to 20.00
Eastern Pennsylvania	15.00 to 15.50

ARCH BARS AND TRANSOMS

Chicago	22.00 to 22.50
St. Louis	24.00 to 24.50

ANGLE BARS—IRON

Chicago	21.00 to 21.50
St. Louis	24.00 to 24.50

Iron and Steel Works Scrap

AXLE TURNINGS

Boston (dealers)	11.00 to 11.50
Buffalo	15.00 to 15.50
Chicago	14.50 to 15.00
Cleveland	15.25 to 15.50
Eastern Pennsylvania	15.00 to 16.00
Pittsburgh	18.00 to 18.50
St. Louis	14.00 to 14.50

STEEL CAR AXLES

Birmingham	19.00 to 20.00
Boston (consumers)	20.00 to 21.00
Buffalo	21.00 to 22.00
Chicago	21.50 to 22.00
Cleveland	21.00 to 21.50
Eastern Pennsylvania	22.00 to 23.00
Pittsburgh	21.00 to 21.50
St. Louis	23.00 to 23.50

SHAFTING

Boston (consumers)	21.00 to 22.00
Chicago	21.50 to 22.00
Eastern Pennsylvania	21.00 to 23.00
New York (dealers)	18.50 to 19.00
St. Louis	23.00 to 23.50

Iron Foundry Scrap

CAR WHEELS

Birmingham, tram car	17.00 to 18.00
Birmingham, iron	16.00 to 17.00
Boston (consumers)6	20.00 to 20.50
Buffalo	20.00 to 20.50
Chicago, iron	20.00 to 20.50
Cincinnati	14.00 to 14.50
Eastern Pennsylvania	18.50 to 19.50
New York iron (dealers)	15.75 to 16.25
Pittsburgh, iron	20.00 to 20.50
Pittsburgh, steel	21.50 to 22.00
St. Louis, iron	21.00 to 21.50

NO. 1 CAST SCRAP

Birmingham, cupola	20.00 to 21.00
Boston (consumers)	22.50 to 23.00
Buffalo	20.00 to 20.50
Chicago, cupola	20.75 to 21.25
Cincinnati No. 1 machinery cupola (net tons)	19.00 to 19.50
Cleveland, cupola	21.00 to 21.50
Detroit (net tons) (dealers)	17.50 to 18.00
Eastern Pennsylvania, cupola	19.00 to 20.00
New York, cupola (dealers)	16.50 to 17.00
Pittsburgh, cupola	19.50 to 20.00
San Francisco	25.00 to 26.00
St. Louis, railroad	21.50 to 22.00
St. Louis, agricultural	21.50 to 22.00
Valleys	21.00 to 21.50

HEAVY CAST

Boston (consumers)	19.00 to 19.50
Buffalo (breakable)	16.50 to 17.00
Cleveland	14.50 to 15.00
Detroit (automobile) (net ton)	23.50 to 24.00
Eastern Pennsylvania	17.00 to 18.00
New York (dealers)	15.50 to 17.00
Pittsburgh	18.00 to 18.50

MALLEABLE

Boston (railroad)	19.00 to 20.00
Buffalo	20.50 to 21.00
Chicago, railroad	21.00 to 21.50
Chicago, agricultural	19.25 to 20.25
Cincinnati, agricultural	15.00 to 15.50
Cincinnati, railroad	19.50 to 20.00
Cleveland, agricultural	20.00 to 20.50
Cleveland, railroad	21.00 to 21.25
Detroit (dealers)	18.00 to 18.50
Eastern Pennsylvania, railroad	17.00 to 18.00
Pittsburgh, railroad	18.50 to 19.00
St. Louis, agricultural	18.00 to 18.50
St. Louis, railroad	18.25 to 18.75

Miscellaneous Scrap

RAILS FOR ROLLING
5 feet and over

Birmingham	17.00 to 17.50
Boston (dealers)	16.00 to 16.25
Chicago	19.00 to 19.50
Cleveland	19.00 to 19.50
Detroit	16.50 to 17.00
Eastern Pennsylvania	19.00 to 20.00
New York (dealers)	18.50 to 19.00
Pittsburgh district	22.50 to 23.00
St. Louis	19.00 to 19.50

LOCOMOTIVE TIRES

Chicago	18.50 to 19.50
St. Louis	17.50 to 18.00

LOW PHOSPHORUS PUNCHINGS

Chicago	18.25 to 18.75
Eastern Pennsylvania	23.00 to 24.00
Pittsburgh	22.00 to 22.50